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August 11, 2005

BY OVERNIGHT DELIVERY AND E-FILE

Mary L. Cottrell, Secretary
Department of Telecommunications and Energy
One South Station
Boston, MA 02110

Re: Bay State Gas Company, D.T.E. 05-27

Dear Ms. Cottrell:

Enclosed for filing, on behalf of Bay State Gas Company ("Bay State"), please find Bay State's responses to the following Record Requests:

From the Attorney General:

RR-AG-60

From the Department:

RR-DTE-126

RR-DTE-136 (Bulk)

RR-DTE-144

RR-DTE-149

RR-DTE-157

Please do not hesitate to telephone me with any questions whatsoever.

Very truly yours,

Patricia M. French

cc: Per Ground Rules Memorandum issued June 13, 2005:

Paul E. Osborne, Assistant Director – Rates and Rev. Requirements Div. (1 copy)
A. John Sullivan, Rates and Rev. Requirements Div. (4 copies)
Andreas Thanos, Assistant Director, Gas Division (1 copy)
Alexander Cochis, Assistant Attorney General (4 copies)
Service List (1 electronic copy)

COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF TELECOMMUNICATIONS AND ENERGY

RESPONSE OF BAY STATE GAS COMPANY TO
RECORD REQUESTS FROM THE ATTORNEY GENERAL
D.T.E. 05-27

Date: August 11, 2005

Responsible: Earl M. Robinson, Consultant (Depreciation)

RR-AG-60: Determine what the net salvage would have been without the sale of equipment to EUSA during the 2000-2001 time frame.

Response: See Attachment RR-AG-60 (A) for the requested net salvage analysis schedules related to Account 305, Attachment RR-AG-60 (B) for the requested net salvage analysis schedules related to Account 311, and Attachment RR-AG-60 (C) for the requested net salvage analysis schedules related to Account 320.

Bay State Gas Company

Response to xRR-AG-60

Acct 305-Page 1 of 3

Attachment RR-AG-60 (A)

Total Company**305.00 STRUCTURES AND IMPROVEMENTS**

Forecasted Future Net Salvage
Based Upon Experienced Net Salvage 1980 - 2003

<u>Year</u>	<u>Original Cost Of</u>	<u>Gross Salvage</u>		<u>Cost of Removal</u>		<u>Net Salvage</u>	
	<u>Retirements</u>	<u>Amount</u>	<u>%</u>	<u>Amount</u>	<u>%</u>	<u>Amount</u>	<u>%</u>
<u>Annual Activity</u>							
1980	1,199.00	0.00	0.00%	482.00	40.20%	(482.00)	-40.20%
1981	563.00	0.00	0.00%	0.00	0.00%	0.00	0.00%
1982	0.00	0.00	0.00%	0.00	0.00%	0.00	0.00%
1983	13,185.00	9,460.00	71.75%	0.00	0.00%	9,460.00	71.75%
1984	7,266.00	0.00	0.00%	0.00	0.00%	0.00	0.00%
1985	0.00	0.00	0.00%	0.00	0.00%	0.00	0.00%
1986	252.00	0.00	0.00%	0.00	0.00%	0.00	0.00%
1987	802.00	0.00	0.00%	0.00	0.00%	0.00	0.00%
1988	0.00	0.00	0.00%	0.00	0.00%	0.00	0.00%
1989	1,366.00	0.00	0.00%	0.00	0.00%	0.00	0.00%
1990	0.00	0.00	0.00%	0.00	0.00%	0.00	0.00%
1991	0.00	0.00	0.00%	0.00	0.00%	0.00	0.00%
1992	60,828.71	0.00	0.00%	0.00	0.00%	0.00	0.00%
1993	35,097.82	0.00	0.00%	0.00	0.00%	0.00	0.00%
1994	0.00	0.00	0.00%	0.00	0.00%	0.00	0.00%
1995	0.00	0.00	0.00%	0.00	0.00%	0.00	0.00%
1996	0.00	0.00	0.00%	0.00	0.00%	0.00	0.00%
1997	32,289.25	0.00	0.00%	0.00	0.00%	0.00	0.00%
1998	0.00	0.00	0.00%	0.00	0.00%	0.00	0.00%
1999	1,650.00	54,519.88	3304.24%	0.00	0.00%	54,519.88	3304.24%
2000	91,947.59	0.00	0.00%	0.00	0.00%	0.00	0.00%
2001	0.00	0.00	0.00%	0.00	0.00%	0.00	0.00%
2002	0.00	0.00	0.00%	0.00	0.00%	0.00	0.00%
2003	55,013.46	14,843.00	26.98%	0.00	0.00%	14,843.00	26.98%

Bay State Gas Company
Total Company

Response to xRR-AG-60
 Acct 305-Page 2 of 3
 Attachment RR-AG-60 (A)

305.00 STRUCTURES AND IMPROVEMENTS

Forecasted Future Net Salvage
Based Upon Experienced Net Salvage 1980 - 2003

<u>Year</u>	<u>Original Cost Of</u>	<u>Gross Salvage</u>		<u>Cost of Removal</u>		<u>Net Salvage</u>	
	<u>Retirements</u>	<u>Amount</u>	<u>%</u>	<u>Amount</u>	<u>%</u>	<u>Amount</u>	<u>%</u>
<u>Three - Year Rolling Bands</u>							
1980 - 1982	1,762.00	0.00	0.00%	482.00	27.36%	(482.00)	-27.36%
1981 - 1983	13,748.00	9,460.00	68.81%	0.00	0.00%	9,460.00	68.81%
1982 - 1984	20,451.00	9,460.00	46.26%	0.00	0.00%	9,460.00	46.26%
1983 - 1985	20,451.00	9,460.00	46.26%	0.00	0.00%	9,460.00	46.26%
1984 - 1986	7,518.00	0.00	0.00%	0.00	0.00%	0.00	0.00%
1985 - 1987	1,054.00	0.00	0.00%	0.00	0.00%	0.00	0.00%
1986 - 1988	1,054.00	0.00	0.00%	0.00	0.00%	0.00	0.00%
1987 - 1989	2,168.00	0.00	0.00%	0.00	0.00%	0.00	0.00%
1988 - 1990	1,366.00	0.00	0.00%	0.00	0.00%	0.00	0.00%
1989 - 1991	1,366.00	0.00	0.00%	0.00	0.00%	0.00	0.00%
1990 - 1992	60,828.71	0.00	0.00%	0.00	0.00%	0.00	0.00%
1991 - 1993	95,926.53	0.00	0.00%	0.00	0.00%	0.00	0.00%
1992 - 1994	95,926.53	0.00	0.00%	0.00	0.00%	0.00	0.00%
1993 - 1995	35,097.82	0.00	0.00%	0.00	0.00%	0.00	0.00%
1994 - 1996	0.00	0.00	0.00%	0.00	0.00%	0.00	0.00%
1995 - 1997	32,289.25	0.00	0.00%	0.00	0.00%	0.00	0.00%
1996 - 1998	32,289.25	0.00	0.00%	0.00	0.00%	0.00	0.00%
1997 - 1999	33,939.25	54,519.88	160.64%	0.00	0.00%	54,519.88	160.64%
1998 - 2000	93,597.59	54,519.88	58.25%	0.00	0.00%	54,519.88	58.25%
1999 - 2001	93,597.59	54,519.88	58.25%	0.00	0.00%	54,519.88	58.25%
2000 - 2002	91,947.59	0.00	0.00%	0.00	0.00%	0.00	0.00%
2001 - 2003	55,013.46	14,843.00	26.98%	0.00	0.00%	14,843.00	26.98%

Bay State Gas Company
Total Company

Response to xRR-AG-60
 Acct 305-Page 3 of 3
 Attachment RR-AG-60 (A)

305.00 STRUCTURES AND IMPROVEMENTS

Forecasted Future Net Salvage
Based Upon Experienced Net Salvage 1980 - 2003

<u>Year</u>	<u>Original Cost Of</u> <u>Retirements</u>	<u>Gross Salvage</u>		<u>Cost of Removal</u>		<u>Net Salvage</u>	
		<u>Amount</u>	<u>%</u>	<u>Amount</u>	<u>%</u>	<u>Amount</u>	<u>%</u>
<u>Three - Year Rolling Bands</u>							
1980 - 2003	301,459.83	78,822.88	26.15 %	482.00	0.16 %	78,340.88	25.99 %

Trend Analysis (End Year) 2003

***Based Upon Three - Year Rolling Averages**

Annual Inflation Rate	2.75%
Average Service Life (ASL)	42.0
Average Retirement Age (Yrs)	6.9
Years To ASL	35.1
Inflation Factor At 2.75% to ASL	2.59

Gross Salvage
Linear Trend Analysis

1984-2003	20 - Year Trend	37.56%
1989-2003	15 - Year Trend	54.42%
1994-2003	10 - Year Trend	59.39%
1999-2003	5 - Year Trend	-36.85%

Forecasted

Gross Salvage	-36.85%
(Five Year Trend)	
Cost Of Removal	0.41%
Net Salvage	-37.26%

Bay State Gas Company

Response to xRR-AG-60

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Total Company

Attachment RR-AG-60 (B)

311.00 LIQUEFIED PETROLEUM GAS EQUIPMENT**Forecasted Future Net Salvage
Based Upon Experienced Net Salvage 1983 - 2003**

<u>Year</u>	<u>Original Cost Of</u>	<u>Gross Salvage</u>		<u>Cost of Removal</u>		<u>Net Salvage</u>	
	<u>Retirements</u>	<u>Amount</u>	<u>%</u>	<u>Amount</u>	<u>%</u>	<u>Amount</u>	<u>%</u>
<u>Annual Activity</u>							
1983	771.00	0.00	0.00%	0.00	0.00%	0.00	0.00%
1984	4,660.00	0.00	0.00%	0.00	0.00%	0.00	0.00%
1985	2,882.00	0.00	0.00%	0.00	0.00%	0.00	0.00%
1986	0.00	0.00	0.00%	0.00	0.00%	0.00	0.00%
1987	0.00	0.00	0.00%	0.00	0.00%	0.00	0.00%
1988	0.00	0.00	0.00%	0.00	0.00%	0.00	0.00%
1989	2,294.00	0.00	0.00%	0.00	0.00%	0.00	0.00%
1990	0.00	0.00	0.00%	0.00	0.00%	0.00	0.00%
1991	3,403.00	0.00	0.00%	0.00	0.00%	0.00	0.00%
1992	46,479.38	8,433.75	18.15%	0.00	0.00%	8,433.75	18.15%
1993	55,002.82	0.00	0.00%	0.00	0.00%	0.00	0.00%
1994	1,490.33	0.00	0.00%	0.00	0.00%	0.00	0.00%
1995	0.00	0.00	0.00%	0.00	0.00%	0.00	0.00%
1996	0.00	0.00	0.00%	0.00	0.00%	0.00	0.00%
1997	23,888.14	0.00	0.00%	0.00	0.00%	0.00	0.00%
1998	24,919.41	0.00	0.00%	0.00	0.00%	0.00	0.00%
1999	70,144.90	0.00	0.00%	0.00	0.00%	0.00	0.00%
2000	932,055.57	0.00	0.00%	0.00	0.00%	0.00	0.00%
2001	0.00	0.00	0.00%	0.00	0.00%	0.00	0.00%
2002	0.00	0.00	0.00%	0.00	0.00%	0.00	0.00%
2003	195,744.53	0.00	0.00%	0.00	0.00%	0.00	0.00%

Bay State Gas Company
Total Company

Response to xRR-AG-60
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Attachment RR-AG-60 (B)

311.00 LIQUEFIED PETROLEUM GAS EQUIPMENT

Forecasted Future Net Salvage
Based Upon Experienced Net Salvage 1983 - 2003

<u>Year</u>	<u>Original Cost Of</u>	<u>Gross Salvage</u>		<u>Cost of Removal</u>		<u>Net Salvage</u>	
	<u>Retirements</u>	<u>Amount</u>	<u>%</u>	<u>Amount</u>	<u>%</u>	<u>Amount</u>	<u>%</u>
<u>Three - Year Rolling Bands</u>							
1983 - 1985	8,313.00	0.00	0.00%	0.00	0.00%	0.00	0.00%
1984 - 1986	7,542.00	0.00	0.00%	0.00	0.00%	0.00	0.00%
1985 - 1987	2,882.00	0.00	0.00%	0.00	0.00%	0.00	0.00%
1986 - 1988	0.00	0.00	0.00%	0.00	0.00%	0.00	0.00%
1987 - 1989	2,294.00	0.00	0.00%	0.00	0.00%	0.00	0.00%
1988 - 1990	2,294.00	0.00	0.00%	0.00	0.00%	0.00	0.00%
1989 - 1991	5,697.00	0.00	0.00%	0.00	0.00%	0.00	0.00%
1990 - 1992	49,882.38	8,433.75	16.91%	0.00	0.00%	8,433.75	16.91%
1991 - 1993	104,885.20	8,433.75	8.04%	0.00	0.00%	8,433.75	8.04%
1992 - 1994	102,972.53	8,433.75	8.19%	0.00	0.00%	8,433.75	8.19%
1993 - 1995	56,493.15	0.00	0.00%	0.00	0.00%	0.00	0.00%
1994 - 1996	1,490.33	0.00	0.00%	0.00	0.00%	0.00	0.00%
1995 - 1997	23,888.14	0.00	0.00%	0.00	0.00%	0.00	0.00%
1996 - 1998	48,807.55	0.00	0.00%	0.00	0.00%	0.00	0.00%
1997 - 1999	118,952.45	0.00	0.00%	0.00	0.00%	0.00	0.00%
1998 - 2000	1,027,119.88	0.00	0.00%	0.00	0.00%	0.00	0.00%
1999 - 2001	1,002,200.47	0.00	0.00%	0.00	0.00%	0.00	0.00%
2000 - 2002	932,055.57	0.00	0.00%	0.00	0.00%	0.00	0.00%
2001 - 2003	195,744.53	0.00	0.00%	0.00	0.00%	0.00	0.00%

Bay State Gas Company
Total Company

Response to xRR-AG-60
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Attachment RR-AG-60 (B)

311.00 LIQUEFIED PETROLEUM GAS EQUIPMENT

Forecasted Future Net Salvage
Based Upon Experienced Net Salvage 1983 - 2003

<u>Year</u>	<u>Original Cost Of</u> <u>Retirements</u>	<u>Gross Salvage</u>		<u>Cost of Removal</u>		<u>Net Salvage</u>	
		<u>Amount</u>	<u>%</u>	<u>Amount</u>	<u>%</u>	<u>Amount</u>	<u>%</u>
<u>Three - Year Rolling Bands</u>							
<hr/>							
1983 - 2003	1,363,735.08	8,433.75	0.62 %	0.00	0.00 %	8,433.75	0.62 %

Trend Analysis (End Year) 2003

***Based Upon Three - Year Rolling Averages**

Annual Inflation Rate	2.75%
Average Service Life (ASL)	36.0
Average Retirement Age (Yrs)	27.9
Years To ASL	8.1
Inflation Factor At 2.75% to ASL	1.25

Gross Salvage
Linear Trend Analysis

1984-2003	20 - Year Trend	1.75%
1989-2003	15 - Year Trend	-0.88%
1994-2003	10 - Year Trend	-1.64%
1999-2003	5 - Year Trend	0.00%

Forecasted

Gross Salvage	0.00%
(Five Year Trend)	
Cost Of Removal	0.00%
Net Salvage	0.00%

Bay State Gas Company

Response to xRR-AG-60

Acct 320-Page 1 of 3

Attachment RR-AG-60 (C)

Total Company**320.00 OTHER EQUIPMENT****Forecasted Future Net Salvage
Based Upon Experienced Net Salvage 1982 - 2003**

<u>Year</u>	<u>Original Cost Of</u>	<u>Gross Salvage</u>		<u>Cost of Removal</u>		<u>Net Salvage</u>	
	<u>Retirements</u>	<u>Amount</u>	<u>%</u>	<u>Amount</u>	<u>%</u>	<u>Amount</u>	<u>%</u>
<u>Annual Activity</u>							
1982	1,245.00	0.00	0.00%	0.00	0.00%	0.00	0.00%
1983	47,472.00	256.00	0.54%	0.00	0.00%	256.00	0.54%
1984	464.00	0.00	0.00%	0.00	0.00%	0.00	0.00%
1985	0.00	0.00	0.00%	0.00	0.00%	0.00	0.00%
1986	513.00	0.00	0.00%	0.00	0.00%	0.00	0.00%
1987	0.00	0.00	0.00%	0.00	0.00%	0.00	0.00%
1988	0.00	0.00	0.00%	0.00	0.00%	0.00	0.00%
1989	22,133.00	0.00	0.00%	0.00	0.00%	0.00	0.00%
1990	0.00	0.00	0.00%	0.00	0.00%	0.00	0.00%
1991	0.00	0.00	0.00%	0.00	0.00%	0.00	0.00%
1992	16,499.91	0.00	0.00%	0.00	0.00%	0.00	0.00%
1993	74,696.79	0.00	0.00%	0.00	0.00%	0.00	0.00%
1994	0.00	0.00	0.00%	0.00	0.00%	0.00	0.00%
1995	5,776.09	0.00	0.00%	0.00	0.00%	0.00	0.00%
1996	0.00	0.00	0.00%	0.00	0.00%	0.00	0.00%
1997	10,738.33	0.00	0.00%	0.00	0.00%	0.00	0.00%
1998	3,715.56	0.00	0.00%	0.00	0.00%	0.00	0.00%
1999	14,267.47	0.00	0.00%	0.00	0.00%	0.00	0.00%
2000	132,007.91	0.00	0.00%	0.00	0.00%	0.00	0.00%
2001	0.00	0.00	0.00%	0.00	0.00%	0.00	0.00%
2002	0.00	0.00	0.00%	0.00	0.00%	0.00	0.00%
2003	92,223.39	0.00	0.00%	0.00	0.00%	0.00	0.00%

Bay State Gas Company
Total Company
320.00 OTHER EQUIPMENT

Response to xRR-AG-60
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 Attachment RR-AG-60 (C)

Forecasted Future Net Salvage
Based Upon Experienced Net Salvage 1982 - 2003

<u>Year</u>	<u>Original Cost Of</u>	<u>Gross Salvage</u>		<u>Cost of Removal</u>		<u>Net Salvage</u>	
	<u>Retirements</u>	<u>Amount</u>	<u>%</u>	<u>Amount</u>	<u>%</u>	<u>Amount</u>	<u>%</u>
<u>Three - Year Rolling Bands</u>							
1982 - 1984	49,181.00	256.00	0.52%	0.00	0.00%	256.00	0.52%
1983 - 1985	47,936.00	256.00	0.53%	0.00	0.00%	256.00	0.53%
1984 - 1986	977.00	0.00	0.00%	0.00	0.00%	0.00	0.00%
1985 - 1987	513.00	0.00	0.00%	0.00	0.00%	0.00	0.00%
1986 - 1988	513.00	0.00	0.00%	0.00	0.00%	0.00	0.00%
1987 - 1989	22,133.00	0.00	0.00%	0.00	0.00%	0.00	0.00%
1988 - 1990	22,133.00	0.00	0.00%	0.00	0.00%	0.00	0.00%
1989 - 1991	22,133.00	0.00	0.00%	0.00	0.00%	0.00	0.00%
1990 - 1992	16,499.91	0.00	0.00%	0.00	0.00%	0.00	0.00%
1991 - 1993	91,196.70	0.00	0.00%	0.00	0.00%	0.00	0.00%
1992 - 1994	91,196.70	0.00	0.00%	0.00	0.00%	0.00	0.00%
1993 - 1995	80,472.88	0.00	0.00%	0.00	0.00%	0.00	0.00%
1994 - 1996	5,776.09	0.00	0.00%	0.00	0.00%	0.00	0.00%
1995 - 1997	16,514.42	0.00	0.00%	0.00	0.00%	0.00	0.00%
1996 - 1998	14,453.89	0.00	0.00%	0.00	0.00%	0.00	0.00%
1997 - 1999	28,721.36	0.00	0.00%	0.00	0.00%	0.00	0.00%
1998 - 2000	149,990.94	0.00	0.00%	0.00	0.00%	0.00	0.00%
1999 - 2001	146,275.38	0.00	0.00%	0.00	0.00%	0.00	0.00%
2000 - 2002	132,007.91	0.00	0.00%	0.00	0.00%	0.00	0.00%
2001 - 2003	92,223.39	0.00	0.00%	0.00	0.00%	0.00	0.00%

Bay State Gas Company
Total Company
320.00 OTHER EQUIPMENT

Response to xRR-AG-60
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 Attachment RR-AG-60 (C)

Forecasted Future Net Salvage
Based Upon Experienced Net Salvage 1982 - 2003

<u>Year</u>	<u>Original Cost Of</u> <u>Retirements</u>	<u>Gross Salvage</u>		<u>Cost of Removal</u>		<u>Net Salvage</u>	
		<u>Amount</u>	<u>%</u>	<u>Amount</u>	<u>%</u>	<u>Amount</u>	<u>%</u>
<u>Three - Year Rolling Bands</u>							
1982 - 2003	421,752.45	256.00	0.06 %	0.00	0.00 %	256.00	0.06 %

Trend Analysis (End Year) 2003

***Based Upon Three - Year Rolling Averages**

		<u>Gross Salvage</u> <u>Linear Trend Analysis</u>		
Annual Inflation Rate	2.75%	1984-2003	20 - Year Trend	-0.10%
Average Service Life (ASL)	20.0	1989-2003	15 - Year Trend	0.00%
Average Retirement Age (Yrs)	12.6	1994-2003	10 - Year Trend	0.00%
Years To ASL	7.4	1999-2003	5 - Year Trend	0.00%
Inflation Factor At 2.75% to ASL	1.22			

Forecasted

Gross Salvage	0.00%
(Five Year Trend)	
Cost Of Removal	0.00%
Net Salvage	0.00%

COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF TELECOMMUNICATIONS AND ENERGY

RESPONSE OF BAY STATE GAS COMPANY TO
RECORD REQUESTS FROM THE D.T.E.
D.T.E. 05-27

Date: August 10, 2005

Responsible: Joseph A. Ferro, Manager Regulatory Policy

RR-DTE-126: Regarding Schedule JAF-2-8, page 11, please indicate the units of measurement for each of the terms used in the formula. Also, please add to the ABRAM, where appropriate, the definition for the maximum increase to any individual rate element, if the Company's proposal is not the GDP-PI.

Response: Please see Attachment RR-DTE-126. The requested additions have been inserted in bold red-line, while the previous changes requested in RR-DTE-101 remain in regular red-line.

ANNUAL BASE RATE ADJUSTMENT MECHANISM

Section

- 1.0** Purpose
- 2.0** Effective Date
- 3.0** Applicability
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- 11.0** Currently Effective Rate Adjustment Table

1.0 Purpose

The purpose of the Annual Base Rate Adjustment Mechanism ("ABRAM") is to establish procedures that allow Bay State Gas Company ("Bay State" or the "Company") subject to the jurisdiction of the Department of Telecommunications and Energy ("Department") to adjust, on an annual basis, its base rates for firm gas sales and firm transportation service pursuant to the Company's Performance Based Rate ("PBR") and Steel Infrastructure Replacement ("SIR") programs and to reflect the annualized impact of energy efficiency savings ("EES"). The PBR program encompasses a price cap rate indexing mechanism, as well as earnings sharing above and below established thresholds and recovery of exogenous costs. The SIR program provides for base rate adjustments that allow Bay State to recover the costs associated with accelerated replacement of bare and unprotected coated steel distribution mains and other Eligible Facilities. EES are the therm savings attributable to the installation of demand-side management ("DSM") measures pursuant to the Company's DSM programs as approved by the Department from time-to-time.

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2.0 Effective Date

The ABRAM shall be effective June 1, 2005 and shall continue subject to the terms of the PBR and SIR mechanisms set forth below. The initial rates established in accordance with Section 6.0 shall remain in effect until October 31, 2006. Subsequent base rate adjustments shall occur so long as either the PBR or SIR mechanisms remain effective or EES continue to be realized. In the event that both the PBR and SIR mechanisms are terminated and EES are no longer realized, the Company's base rates, as adjusted pursuant to the ABRAM, shall remain in effect until modified by the Department pursuant to a subsequent base rate proceeding.

2.1 Term of PBR Base Rate Adjustment Mechanism

The PBR Base Rate Adjustment mechanism shall continue for a term of five years through October 31, 2010. No further adjustment to the PBR component of the ABRAM shall occur after the completion of the five-year term ending October 31, 2010.

2.2 Term of SIR Base Rate Adjustment Mechanism

The SIR Base Rate Adjustment mechanism shall remain in effect until the Company's base rates are modified by the Department pursuant to a subsequent base rate proceeding.

3.0 Applicability

This mechanism shall apply an adjustment to the base rates of each of the Company's firm sales and firm transportation Rate Schedules, subject to the jurisdiction of the Department, as determined in accordance with the provisions of this mechanism. Such ABRAM shall be determined annually by the Company as defined below, subject to review and approval by the Department as provided for in this mechanism.

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4.0 Definitions

The following definitions shall apply throughout the provisions of the ABRAM tariff.

- (1) **Base Rate Element** is any customer, volumetric or demand charge reflected in the Company's Rate Schedules that recovers a portion of the Company's base revenue requirement as established by the Department in its most recent base rate case.
- (2) **Base Rates** are the compilation of Base Rate Elements for all of the Company's Rate Schedules
- (3) **Calendar Year** is the annual period beginning on January 1st and ending on December 31st.
- (4) **Customer Class** is the group of customers all taking service pursuant to the same Rate Schedule.
- (5) **Energy Efficiency Savings** shall be the annualized therm savings attributable to energy efficiency measures installed during the Calendar Year.
- (6) **Off-peak Period** is the continuous period from May 1st through October 31st.
- (7) **PBR Adjusted Base Rate** is the base rate in effect for the Prior Year plus the rate change calculated through the application of the PBR Price Cap Formula to the base rates in effect for the Prior Year.
- (8) **PBR Price Cap Formula** is the mathematical expression set forth in Section 7.3 used to calculate the percentage change in Base Rates for the Rate Year.
- (9) **Peak Period** is the continuous period from November 1st through April 30th.
- (10) **Prior Year** is the annual period ending immediately prior to the Rate Year.
- (11) **Rate Year** is the annual period that the adjusted base rates shall be effective beginning on November 1st.

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- (12) **SIR Revenue Requirements** are the revenue requirements for the Company's SIR program for the Rate Year.
- (13) **SIR Base Rate** is the total component of the Company's Base Rates that recovers the aggregate SIR Revenue Requirements for investments made over the duration of the SIR Program.

5.0 Annual Base Rate Adjustment Formula

The annual base rate adjustment formula shall be applied for each Base Rate Element of each Rate Schedule and shall be calculated in accordance with the following formula:

$$BR_T^{n,e} = (BR_{T-1}^{n,e} - BR_SIR_{T-1}^{n,e}) \times (1 + PBR_CAP_T^{n,e}) \times (1 + EE_ADJ_T^{n,e}) + BR_SIR_T^{n,e}$$

Where:

$BR_T^{n,e}$	The Base Rate Element e applicable to Rate Schedule n for the Rate Year
$BR_{T-1}^{n,e}$	The Base Rate Element e applicable to Rate Schedule n for the Prior Year
$BR_SIR_{T-1}^{n,e}$	The SIR Base Rate for Base Rate Element e applicable to Rate Schedule n for the Prior Year
$PBR_CAP_T^{n,e}$	The percentage change for Base Rate Element e applicable to Rate Schedule n for the Rate Year calculated pursuant to the Company's PBR Program.
$EE_ADJ_T^{n,e}$	The Energy Efficiency Adjustment Percentage for Base Rate Element e applicable to Rate Schedule n for the Rate Year

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$BR_SIR_T^{n,e}$ The SIR Base Rate for Base Rate Element e applicable to Rate Schedule n for the Rate Year

6.0 Determination of Initial Base Rates

The initial base rates shall be those established by the Department in Docket No. D.T.E. 05-27. The initial base rates shall be set forth in Column (I) of the Currently Effective Rate Adjustment Table contained in Section 11.0 to be effective through October 31, 2006. The first ABRAM change to the initial base rates shall be effective November 1, 2006. The Rate Adjustment Table contained in Section 11.0 shall be updated each year in the Company's annual ABRAM filings.

7.0 Calculation of PBR Annual Rate Adjustment

7.1 Description of PBR Program

The Company's PBR program replaces traditional cost of service ratemaking with an incentive-based mechanism. The PBR program includes price cap, earnings sharing and exogenous components. The price cap component limits the change in base rates to the rate of input price inflation representative of the gas distribution industry less offsets for productivity and a consumer dividend. The earnings sharing component provides for sharing of earnings that are outside symmetrical bands above and below Bay State's authorized Return on Equity. The exogenous cost component allows the Company to reflect costs or credits in the PBR mechanism that derive from unanticipated events that are beyond Bay State's direct control.

ANNUAL BASE RATE ADJUSTMENT MECHANISM

7.2 Definitions

- (1) **Average Unit Price** shall be the price per therm calculated by dividing the total base revenues for the Customer Class for the Prior Year by the normalized annual throughput for the class for the Prior Year.
- (2) **Basis Point** shall be one one-hundredth of a percentage point.
- (3) **Consumer Dividend** is the benefit to consumers of future productivity gains attributable to performance-based ratemaking for Bay State's services as established by the Department in D.T.E. 05-27.
- (4) **Earnings Sharing Bandwidth** is the percentage range equal to 400 Basis Points below the percentage Return on Equity authorized by the Department to 400 Basis Points above the percentage Return on Equity authorized by the Department in D.T.E. 05-27.
- (5) **Exogenous Events** are occurrences that have a material and disproportionate impact on Bay State that are beyond the Company's control and are not otherwise reflected in the PBR formula.
- (6) **Input Price Trend** is the measure of change in the prices for all inputs used to provide regulated gas distribution services.
- (7) **Productivity Trend** is the measure of change in productivity associated with providing regulated gas distribution services.
- (8) **Return on Equity** is the allowed rate of return on equity as established in D.T.E. 05-27.
- (9) **X Factor** is the productivity growth index as established by the Department in D.T.E. 05-27.
- (10) **Z Factor** is the sum of the cost impacts of material Exogenous Events.

ANNUAL BASE RATE ADJUSTMENT MECHANISM**7.3 PBR Price Cap Adjustment Formula**

$$\text{PBR_CAP}_T = (\text{GDPPI}_{T-1} - X) + \frac{(\text{Z}_{\text{REV}} + \text{ESM}_{\text{REV}})}{(\text{BASE_REV}_{T-1} - \text{SIR_REV}_{T-1})}$$

and:

$$\text{BASE_REV}_{T-1} = \sum_{n=1}^{n=i} \sum_{e=1}^{e=j} \text{BR}_{T-1}^{n,e} \times \text{BD}^{n,e}$$

and:

$$\text{SIR_REV}_{T-1} = \sum_{n=1}^{n=i} \sum_{e=1}^{e=j} \text{BR_SIR}_{T-1}^{n,e} \times \text{BD}^{n,e}$$

and:

$$X = \text{TFPT}_{\text{GDI-US}} + \text{IPT}_{\text{GDI-US}} + \text{CD}$$

Where:

PBR_CAP_T The percentage change in the Average Unit Price for all Rate Schedules pursuant to Bay State's PBR Program.

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$GDPPI_{T-1}$	The average annual percentage change in the United States Gross Domestic Product Price Inflation for the four most recent quarterly reporting periods as of the second quarter of the Calendar Year as published by the United States Department of Commerce.
X	The productivity or X Factor, which shall be the sum of the Productivity Trend differential, Input Price Trend differential, and the Consumer Dividend, as established by the Department in D.T.E. 05-27.
Z_{REV}	The sum of cost impacts of all Exogenous Events, positive or negative, as provided for in Section 7.5.
ESM_{REV}	The earnings to be shared with customers under the mechanism specified in Section 7.7.
$BASE_REV_{T-1}$	The base revenues calculated by multiplying each Base Rate Element shown in Column (B) of the Currently Effective Rate Adjustment Table in Section 11 for each Company Rate Schedule, by the corresponding weather-normalized billing determinants for the most recent Calendar Year.
SIR_REV_{T-1}	The SIR Revenues calculated by multiplying each SIR Base Rate shown in Column (C) of the Currently Effective Rate Adjustment Table in Section 11 for each Company Rate Schedule by the corresponding weather-normalized billing determinants for the most recent Calendar Year.
I	The total number of firm Rate Schedules to which the ABRAM is applicable.
J	The total number of Base Rate Elements for Rate Schedule n .
$BR_{T-1}^{n,e}$	The Base Rate Element e shown in Column (B) of the Currently Effective Rate Adjustment Table in Section 11.0 for Rate Schedule n .

ANNUAL BASE RATE ADJUSTMENT MECHANISM

$BD^{n,e}$	The most recent Calendar Year weather-normalized billing determinants in therms corresponding to Base Rate Element e applicable to Rate Schedule n .
$BR_SIR^{n,e}_{T-1}$	The SIR Base Rate e shown in Column (C) of the Currently Effective Rate Adjustment Table for Rate Schedule n .
TPT_{GDI-US}	The total Productivity Trend differential between the gas distribution industry in the Northeast and the overall United States economy as approved by the Department in D.T.E. 05-27.
IPT_{GDI-US}	The total Input Price Trend differential between the gas distribution industry in the Northeast and the overall United States economy, as approved by the Department in D.T.E. 05-27.
CD	The Consumer Dividend, as approved by the Department in D.T.E. 05-27.

7.4 PBR Annual Rate Adjustment

The Company may apply a non-uniform percentage change to each Base Rate Element of each firm Rate Schedule so long as the change in the Average Unit Price for the Customer Class is equal to the PBR Price Cap Adjustment. For purposes of calculating the Average Unit Price, the Company shall employ the weather-normalized billing determinants for the previous Calendar Year. The maximum percentage change to any individual Base Rate Element pursuant to the PBR mechanism shall be **the higher sum of the GDP-PI and the PBR Price Cap Adjustment**~~and the X Factor~~.

7.5 Exogenous Events

The costs and/or cost reductions associated with unforeseen Exogenous Events that are beyond Bay State's control that occurred during the most recent Calendar Year and that are not reflected in the elements of the PBR price cap formula may be included in the PBR mechanism through the Z Factor. Examples of Exogenous Events are changes in

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tax laws that uniquely affect the local gas distribution industry, changes in accounting rules that uniquely affect the local gas distribution industry, and regulatory, legislative or judicial actions that uniquely affect the local gas distribution industry. Only material Exogenous Events, i.e. with cost impacts in excess of \$600,000 positive or negative, shall be reflected in the Z Factor. The eligibility of the cost impacts of Exogenous Events for inclusion in the Z Factor shall be reviewed by the Department.

7.6 Revenue Exclusions

Base Rate revenue requirement items that are recovered through separate tracking mechanisms shall be excluded from the price indexing formula. The Company's SIR program costs described in Section 9 and Pension and Benefit Costs recovered through the Local Distribution Adjustment Clause shall be excluded from the PBR program.

7.7 Earnings Sharing

An Earnings Sharing component of the PBR program provides the Company and its Customers with protections in the event that the productivities achieved under the proposed program deviate materially from those anticipated and reflected in the PBR Price Cap Formula. In the event that the Company's actual Return on Equity for any annual period beginning January 1st of the years 2006 through the term of the PBR program is outside of the Earnings Sharing Bandwidth, the difference between actual earnings and earnings calculated at the authorized Return on Equity shall be shared 75% to the Company and 25% to Customers. There shall be no earnings sharing when the Company's actual Return on Equity falls within the Earnings Sharing Bandwidth. The Company's net income and year-ending common equity balances as reported in its annual report to the Department shall be used to calculate the level of earnings sharing.

7.8 Information to be Filed with the Department

On or before June 1st of each year, the Company shall file information and supporting schedules with the Department necessary for the Department to review and approve the

ANNUAL BASE RATE ADJUSTMENT MECHANISM

PBR Base Rate Adjustment to be included in the ABRAM for the subsequent Rate Year. Such information shall include the results of the calculation of the PBR Price Cap Adjustment Formula, descriptions and accounting of any Exogenous Events, and an earnings sharing calculation.

8.0 Calculation of Energy Efficiency Adjustment Factor

8.1 Applicability

The volumetric rates for firm Customer Classes that participate in the Company's energy efficiency programs shall be further adjusted to reflect the annualized impact of energy efficiency programs on the therm gas use of firm Customer Classes for the previous Calendar Year. The adjustment shall be calculated on a percentage basis for each Base Rate Element.

8.2 Determination of Energy Efficiency Savings

The Company shall calculate the therm gas use impact of the energy efficiency measures installed during the previous Calendar Year. The therm savings shall be annualized to reflect a full year's impact. The annualized therm savings shall be broken down by Customer Class and further disaggregated by Peak Period and Off-peak Period and by head and tail block, where applicable.

8.3 Energy Efficiency Adjustment Factor Formula

$$\text{EE_ADJ}_T^{n,e} = \frac{\frac{\text{Percentage}}{\text{Therms}} \text{BD}^{n,e}}{\text{BD}^{n,e} - \text{EE}^{n,e}} - 1$$

Where:

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$EE_ADJ_T^{n,e}$	The Energy Efficiency Adjustment Percentage for Base Rate Element e applicable to Rate Schedule n for the Rate Year.
$BD^{n,e}$	The most recent Calendar Year weather-normalized billing determinants in therms corresponding to Base Rate Element e applicable to Rate Schedule n .
$EE^{n,e}$	The annualized Energy Efficiency savings in therms for the most recent Calendar Year associated with Base Rate Element e applicable to Rate Schedule n .

8.4 Information to be Filed with the Department

On or before June 1st of each year, the Company shall file information and supporting schedules with the Department necessary for the Department to review and approve the Energy Efficiency Adjustment to be included in the ABRAM for the subsequent Rate Year. Such information shall include a description of the energy efficiency measures installed and associated therm savings by Rate Schedule.

9.0 Calculation of SIR Base Rate Adjustment**9.1 Description of SIR Program**

The Company's SIR program provides for the accelerated replacement of aging steel infrastructure in order to maintain safe and reliable service. The costs associated with the program less any operations and maintenance ("O&M") expense savings are recovered through the ABRAM.

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9.2 Definitions

- (1) **Accelerated Gross Plant Investments** are the capitalized cost of SIR plant investments including applicable overhead recorded on the Company's books that exceed the Non-Accelerated Investment Threshold.
- (2) **Accumulated Deferred Income Taxes** is the net reduction in Federal income and State franchise taxes associated with the use of accelerated depreciation allowed for income tax purposes.
- (3) **Accumulated Reserve for Depreciation** is the net credit balance arising from the provision for Depreciation.
- (4) **Carrying Costs** are the costs incurred by the Company to finance investments in Eligible Facilities ~~prior to inclusion~~from the time those facilities are put in service to the time included in the SIR Base Rate Adjustment mechanism
- (5) **Depreciation Expense** is the return of the Company's investment in Rate Base at established annual rates as approved by the Department in D.T.E. 05-27.
- (6) **Eligible Facilities** are those facilities in connection with the projects undertaken by the Company to replace bare and unprotected coated steel distribution mains on an accelerated basis.
- (7) **Non-Accelerated Investment Threshold** is the typical annual level of steel infrastructure replacement investment as established by the Department in D.T.E. 05-27.
- (8) **Rate Base** is the investment value upon which Bay State is permitted to earn its authorized rate of return.
- (9) **Property Tax Rate** is the composite property tax rate paid by the Company calculated in its most recent base rate proceeding as the ratio of total annual property taxes paid to total net plant in service.

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- (10) **SIR Savings** are the O&M expense savings realized by the Company attributable to the facilities installed under the SIR Program.

9.3 **SIR Investments**

SIR Investments are the costs of Eligible Facilities and shall include the costs of main replacement projects including any connected facilities such as services, meters or regulators that must be installed or replaced to enable the main replacement to become operational. SIR Investments may include investments in one or more of the following plant accounts:

- (1) Account No. 367, Transmission Mains
- (2) Account No. 376, Distribution Mains
- (3) Account No. 380, Distribution Services
- (4) Account No. 381, Meters
- (5) Account No. 382, Meter Installations
- (6) Account No. 383, House Regulators
- (7) Account No. 385, Industrial Measuring and Regulating Equipment

9.4 **Eligible SIR Revenue Requirements**

Eligible SIR Revenue Requirements shall include depreciation, property taxes, return and associated income taxes associated with total SIR Investments made since the initiation of the SIR program. Carrying Costs on SIR Investments from the time each investment is placed into service until recovery begins shall also be considered Eligible SIR Revenue Requirements.

9.5 **Eligible SIR Savings**

Eligible SIR Savings shall be the lower O&M expense associated with reduced leak repair activity and shall be reflected as an offset to SIR Revenues **Requirements**. Eligible SIR Savings shall be calculated based on the reduction in the number of leak repairs and

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the associated O&M offset to the avoided costs of leak repairs.

9.6 SIR Revenue Requirements Formula

$$\text{SIR_REV}_T = (\text{RB}_{\text{SIR}} \times \text{PTRR}) + \text{DEPR}_{\text{SIR}} + \text{PTMS}_{\text{SIR}} + \text{CC}_{\text{SIR}} - \text{SAV}_{\text{SIR}}$$

and:

$$\text{RB}_{\text{SIR}} = \text{AGP}_{\text{SIR}} - \text{ARD}_{\text{SIR}} - \text{ADIT}_{\text{SIR}}$$

Where:

SIR_REV_T	The SIR Revenue Requirements for the Rate Year.
RB_{SIR}	The Rate Base associated with the SIR Program as of the end of the Calendar Year preceding the Rate Year.
PTRR	The pre-tax rate of return as established by the Department in D.T.E. 05-27.
DEPR_{SIR}	The depreciation expense associated with the <u>accumulated</u> plant investment in the SIR Program.
PTMS_{SIR}	The property taxes calculated based on the <u>accumulated</u> net plant investment in mains and services associated with the SIR Program multiplied by the Property Tax Rate.
CC_{SIR}	Carrying Costs calculated monthly as the product of the Company's pre-tax rate of return <u>as approved in D.T.E. 05-27</u> multiplied by the <u>Eligible Accelerated</u> Gross Plant Investments associated with SIR Program plant placed in service, but not yet recovered through rates.
SAV_{SIR}	The total Eligible SIR Savings associated with reduced leak repair activity, <u>as defined in Section 9.5.</u>

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AGP_{SIR}	The Accelerated-Eligible Gross Plant Investments associated with the SIR Program as of the end of the Calendar Year preceding the Rate Year.
ARD_{SIR}	The Accumulated Reserve for Depreciation associated with the SIR Investments as of the end of the Calendar Year preceding the Rate Year.
$ADIT_{SIR}$	The Accumulated Deferred Income Taxes associated with the SIR Investments as of the end of the Calendar Year preceding the Rate Year.

9.7 SIR Base Rate Adjustment

The SIR Revenue Requirements shall be recovered from Customers through each Base Rate Element of the Company's firm Rate Schedules by applying a SIR Base Rate Adjustment to each existing Base Rate Element excluding the SIR Base Rate for the Prior Year. The SIR Base Rate Adjustments shall be derived by allocating the overall SIR Revenue Requirements to each Base Rate Element by the percentage of Prior Year total ~~distribution base~~ revenues associated with each Base Rate Element. The resulting revenues by each Base Rate Element are then divided by the corresponding weather-normalized billing determinants for the Prior Year to derive the SIR Base Rate Adjustment.

9.8 Annual SIR Budget

In conjunction with its annual ABRAM filing each year, the Company shall provide the Department with a description of the SIR projects that it expects to complete during the current construction cycle and to include in the SIR Base Rate Adjustment for the following year. In addition, the Company will estimate the gross plant investment associated with each project. The list of projects and associated cost estimates shall be based on information available to the Company at the time it prepares the Annual SIR Budget and shall be provided for informational purposes. The specific projects

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undertaken during the current construction cycle and the associated cost of each project may vary due to circumstances and information that are not known by the Company at the time that the Annual SIR Budget was prepared.

9.9 Information to be Filed with the Department

On or before June 1st of each year, the Company shall file information and supporting schedules with the Department necessary for the Department to review and approve the SIR Revenue Requirements and the SIR Base Rates to be included in the ABRAM for the subsequent Rate Period. Such information shall include descriptions of all SIR Investments and the results of the calculation of the SIR Revenue Requirements Formula for the Rate Year. The Company shall also describe any factors that affected changes to the list of projects undertaken from those identified to the Department in the Company's Annual SIR Budget filed the previous year as well as any material variances in the project costs.

10.0 Information Required to be Filed with the Department

Information pertaining to all of the components of the Annual Base Rate Adjustment Mechanism is to be filed with the Department as specified in Sections 7, 8 and 9. In addition, the Company shall file revised tariff sheets reflecting the impact of applying the base rate changes provided for herein.

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11.0 Currently Effective Rate Adjustment Table

Customer Class And Charge	Previously Effective Rates			Currently Effective Rates				
	Base Rate	SIR Base Rate	Base Rate w/o SIR Base Rate	PBR ADJ %	PBR Adjusted Base Rate	Energy Eff. %	SIR Base Rate	TOTAL Base Rate
	Note 1/ (A)	Note 2/ (C)	(B) – (C) (D)	Note 3/ (E)	(1+E) * (D) (F)	Note 4/ (G)	Note 5/ (H)	(F) x (1 + G) + (H) (I)
<u>R-1</u>								
Customer Charge	\$11.60	TBD	\$11.60	TBD	TBD	TBD	\$0.00	\$11.60
Peak 0-12 therms	0.2393	TBD	0.2393	TBD	TBD	TBD	0.0000	0.2393
Peak 12+ therms	0.1928	TBD	0.1928	TBD	TBD	TBD	0.0000	0.1928
Off-Peak 0-10 therms	0.2393	TBD	0.2393	TBD	TBD	TBD	0.0000	0.2393
Off-Peak 10+ therms	0.1928	TBD	0.1928	TBD	TBD	TBD	0.0000	0.1928
<u>R-2</u>								
Customer Charge	\$6.25	TBD	\$6.25	TBD	TBD	TBD	\$0.00	\$6.25
Peak	0.1158	TBD	0.1158	TBD	TBD	TBD	0.0000	0.1158
Off-Peak	0.1158	TBD	0.1158	TBD	TBD	TBD	0.0000	0.1158
<u>R-3</u>								
Customer Charge	\$12.10	TBD	\$12.10	TBD	TBD	TBD	\$0.00	\$12.10
Peak 0-125 therms	0.3183	TBD	0.3183	TBD	TBD	TBD	0.0000	0.3183
Peak 90+ therms	0.2224	TBD	0.2224	TBD	TBD	TBD	0.0000	0.2224
Off-Peak 0-125 therms	0.3183	TBD	0.3183	TBD	TBD	TBD	0.0000	0.3183
Off-Peak 30+ therms	0.2224	TBD	0.2224	TBD	TBD	TBD	0.0000	0.2224
<u>R-4</u>								
Customer Charge	\$6.25	TBD	\$6.25	TBD	TBD	TBD	\$0.00	\$6.25
Peak	0.0708	TBD	0.0708	TBD	TBD	TBD	0.0000	0.0708
Off-Peak	0.0708	TBD	0.0708	TBD	TBD	TBD	0.0000	0.0708
<u>OL</u>								
Per Light per Month	\$2.58	TBD	\$2.58	TBD	TBD	TBD	\$0.00	\$2.58
<u>G-40</u>								
Customer Charge	\$19.00	TBD	\$19.00	TBD	TBD	TBD	\$0.00	\$19.00
Peak	0.3090	TBD	0.3090	TBD	TBD	TBD	0.0000	0.3090
Off-Peak	0.3090	TBD	0.3090	TBD	TBD	TBD	0.0000	0.3090

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Customer Class And Charge	Previously Effective Rates			Currently Effective Rates				
	Base Rate	SIR Base Rate	Base Rate w/o SIR Base Rate	PBR ADJ %	PBR Adjusted Base Rate	Energy Eff. %	SIR Base Rate	TOTAL Base Rate
	Note 1/ (B)	Note 2/ (C)	(B) – (C) (D)	Note 3/ (E)	(1+E) * (D) (F)	Note 4/ (G)	Note 5/ (H)	(F) x (1 + G) + (H) (I)

G-50								
Customer Charge	\$19.00	TBD	\$19.00	TBD	TBD	TBD	\$0.00	\$19.00
Peak	0.2818	TBD	0.2818	TBD	TBD	TBD	0.0000	0.2818
Off-Peak	0.2818	TBD	0.2818	TBD	TBD	TBD	0.0000	0.2818
G-41								
Customer Charge	\$65.00	TBD	\$65.00	TBD	TBD	TBD	\$0.00	\$65.00
Peak	0.1920	TBD	0.1920	TBD	TBD	TBD	0.0000	0.1920
Off-Peak	0.1216	TBD	0.1216	TBD	TBD	TBD	0.0000	0.1216
G-51								
Customer Charge	\$65.00	TBD	\$65.00	TBD	TBD	TBD	\$0.00	\$65.00
Peak	0.1774	TBD	0.1774	TBD	TBD	TBD	0.0000	0.1774
Off-Peak	0.0826	TBD	0.0826	TBD	TBD	TBD	0.0000	0.0826
G-42								
Customer Charge	\$213.00	TBD	\$213.00	TBD	TBD	TBD	\$0.00	\$213.00
Peak	0.1794	TBD	0.1794	TBD	TBD	TBD	0.0000	0.1794
Off-Peak	0.0778	TBD	0.0778	TBD	TBD	TBD	0.0000	0.0778
G-52								
Customer Charge	\$213.00	TBD	\$213.00	TBD	TBD	TBD	\$0.00	\$213.00
Peak	0.1682	TBD	0.1682	TBD	TBD	TBD	0.0000	0.1682
Off-Peak	0.0657	TBD	0.0657	TBD	TBD	TBD	0.0000	0.0657
G-43								
Customer Charge	\$781.00	TBD	\$781.00	TBD	TBD	TBD	\$0.00	\$781.00
Peak	0.0507	TBD	0.0507	TBD	TBD	TBD	0.0000	0.0507
Off-Peak	0.0193	TBD	0.0193	TBD	TBD	TBD	0.0000	0.0193
Peak Demand	2.1586	TBD	2.1586	TBD	TBD	TBD	0.0000	2.1586
Off-Peak Demand	0.6713	TBD	0.6713	TBD	TBD	TBD	0.0000	0.6713

Issued by: Stephen H. Bryant
President

Issued On: April 27, 2005
Effective: June 1, 2005

ANNUAL BASE RATE ADJUSTMENT MECHANISM

Customer Class And Charge	Previously Effective Rates			Currently Effective Rates				
	Base Rate	SIR Base Rate	Base Rate w/o SIR Base Rate	PBR ADJ %	PBR Adjusted Base Rate	Energy Eff. %	SIR Base Rate	TOTAL Base Rate
	Note 1/ (A)	Note 2/ (B)	(B) – (C) (D)	Note 3/ (E)	(1+E) * (D) (F)	Note 4/ (G)	Note 5/ (H)	(F) x (1 + G) + (H) (I)

G-53								
Customer Charge	\$781.00	TBD	<u>\$781.00</u>	TBD	TBD	TBD	\$0.00	\$781.00
Peak	0.0507	TBD	<u>0.0507</u>	TBD	TBD	TBD	0.0000	0.0507
Off-Peak	0.0193	TBD	<u>0.0193</u>	TBD	TBD	TBD	0.0000	0.0193
Peak Demand	2.1586	TBD	2.1586	TBD	TBD	TBD	0.0000	2.1586
Off-Peak Demand	0.6713	TBD	0.6713	TBD	TBD	TBD	0.0000	0.6713

Notes: 1/ From Column (I) of the previous year's Annual Base Rate Adjustment Filing Rate Table.
2/ From Column (H) of the previous year's Annual Base Rate Adjustment Filing .
3/ Calculated in accordance with Section 7.3 and Section 7.4.
4/ Calculated in accordance with Section 8.3.
5/ Calculated in accordance with Section 9.7.
TBD – To be determined initially in the Company's first Annual Base Adjustment Mechanism filing.

COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF TELECOMMUNICATIONS AND ENERGY

RESPONSE OF BAY STATE GAS COMPANY TO
RECORD REQUESTS FROM THE D.T.E.
D.T.E. 05-27

Date: August 11, 2005

Responsible: Danny G. Cote, General Manager

BULK ATTACHMENT

RR-DTE-136: Regarding the first page of the summary attachments to responses to DTE-3-22 and DTE-3-27, for each project provide supporting workpapers detailing how the pre-construction IRR and the actual post-construction IRR was calculated.

Response: Please see Attachment RR-DTE-136 (a) for the pre-construction internal rate of returns ("IRR") and post-construction IRRs calculated for projects listed in DTE-3-22 Revised. Please see Attachment RR-DTE-136 (b) for the pre-construction IRRs and post-construction IRRs calculated for projects listed in DTE-3-27 Revised.

Each attachment consists of a summary sheet including the internal hurdle rates (Col. 4), pre-construction IRRs (Col. 5) and post-construction IRRs (Col. 12) and is followed by a cover sheet / identifier page, a post-construction IRR work-paper and, when available, the original pre-construction IRR work-papers for each project listed in DTE-3-22 Revised and DTE-3-27 Revised. For projects where detailed pre-construction IRRs are not available a copy of the project's authorization sheet, with the original posting of the IRR that was calculated at the time the project was proposed and approved, is provided.

For example, for Attachment RR-DTE-136 (a), the first page in the attachment is the summary sheet labeled "Revenue Producing Plant Additions, Account 367 (Mains) > \$100K" followed by the cover sheet for the project with the assigned list number 1, West Springfield / ConEd, on Attachment DTE-3-22 Revised. As such, the cover sheet has been labeled:

Attachment RR-DTE-136 (a)

Revenue Producing Plant Additions
Account 367 (Mains) >\$100K

List No. 1 (on DTE-3-22 Revised)

For Attachment RR-DTE-136 (b), the first page in the attachment is the summary sheet labeled "Revenue Producing Plant Additions, Account 367 (Mains) > \$50K and < \$100K" followed by the cover sheet for the project with the assigned list number 1, Lawrence / Clifton Street, on Attachment DTE-3-27 Revised. As such, the cover sheet has been labeled:

Attachment RR-DTE-136 (b)

Revenue Producing Plant Additions
Account 367 (Mains) > \$50K and < \$100K

List No. 1 (on DTE-3-27 Revised)

Revenue Producing Plant Additions Account 367 (Mains) > \$100K							
Col. 1	Col. 2	Col. 3.	Col. 4	Col. 5		Col. 12	Col. 13
List No.	Year	Location	Internal Hurdle Rate for Project Approval (%)	Pre – Construction Estimated IRR (%)		Post – Construction IRR (%)	Project ID
1	2001	West Springfield / ConEd	10%	16%		19%	S01D1038
2	2001	Foxboro / Gillette Stadium – Washington St.	10%	16%		11%	B01D0041
3	2000	Methuen / Spicket Common	11.4%	10%		12%	L2000D0045
4	1999	Bridgewater / MCI Bridgewater	8.75%	15%		10%	B99D0121
5	1999	North Andover / Brooks School – Great Pond Road	8.75%	12%		10%	L99D0052
6	1999	Methuen / The Loop, Oak St.	8.75%	17%		30%	L99D0026
7	1999	Springfield / Van Sickle Sc. – Merrimack Ave	8.75%	3%	1/	12%	S99D1064
8	1999	Southwick / Sunnyside Ranch Road	8.75%	12%		0%	S99D1091
9	1998	Raynham / King Philip Estates	8.75%	11%		11%	B98D0093
10	1998	South Hadley / Rexham Graphics	8.75%	34%		48%	S98D1052
11	1998	North Andover / Genetics	8.75%	46%		34%	L98D0055
12	1997	Wrentham / Outlet Mall	8.75%	15%		16%	B97D0086
13	1997	Southwick / Southwick Exp. – So. Longyard Rd.	8.75%	12%		7%	S97D1033
14	1995	North Andover / Philips Academy – Waverly Road	9.58%	13%	1/	22%	L95D0010
15	1994	Agawam / South West Street	8.55%	9%		5%	South West Street
16	1993	Ludlow / Electric Park	8.55%	9%	1/	5%	Electric Park
17	1992	Monson / Palmer MassPower and Monson / Palmer Expansion		See DTE-16-27		See DTE-3-24	

1/ Detailed Pre-Construction Internal Rate of Return Analysis is not available for this project

ATTACHMENT RR-DTE-136 (a)

Revenue Producing Plants Additions
Account 367 (Mains) > \$100K

List No. / **(on DTE-3-22 Revised)**

POST CONSTRUCTION - RATE OF RETURN ESTIMATE

WORKPAPER

POST-CONSTRUCTION

Project: ConEd
West Springfield

Total Capital and O&M Costs

Meter Counts, Mcf Load and Net Revenue

Capital			Meter Counts	1
Mains	\$	908,786	Load (Mcf)	125,000
Services		0		
Meters		0		
Incremental Capital		191,808	Net Revenue	\$ 456,276 annual
Total	\$	1,100,594		

O & M costs \$ 10,000 annual

Property Tax Rate \$ 20.00 per thousand

Results Summary

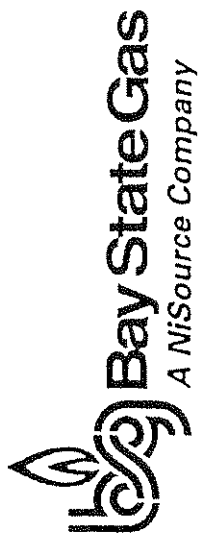
10 Yrs.
19.31%
\$628,854
\$0

* IRR
* NPV
* Customer Contribution

Year	Investment	Revenue	O&M	Property Tax	Profit Before Taxes	Depreciation 20 Year Class	Income Taxes	Total Net Income	Total Net Cash Flow (\$1,213,178)	P.V. OF Cash Flow (\$1,213,178)	Payback Calculation (\$1,213,178)	Payback Period
1	\$1,213,178	\$456,276	\$10,000	\$24,264	\$422,012	\$45,494	\$147,708	\$228,810	\$274,304	252,535	(\$960,643)	1
2		456,276	10,000	24,264	422,012	87,579	131,198	203,235	296,814	246,488	(714,154)	2
3		456,276	10,000	24,264	422,012	81,004	133,777	207,231	288,235	224,914	(489,240)	3
4		456,276	10,000	24,264	422,012	74,938	136,157	210,917	285,855	205,356	(283,885)	4
5		456,276	10,000	24,264	422,012	69,309	138,365	214,338	283,647	187,598	(96,287)	5
6		456,276	10,000	24,264	422,012	64,116	140,402	217,493	281,610	171,470	75,183	6
7		456,276	10,000	24,264	422,012	59,300	142,292	220,420	279,720	156,803	231,987	7
8		456,276	10,000	24,264	422,012	54,860	144,034	223,118	277,978	143,461	375,447	8
9		456,276	10,000	24,264	422,012	54,132	144,319	223,561	277,693	131,940	507,387	9
10		456,276	10,000	24,264	422,012	54,120	144,324	223,568	277,688	121,467	628,854	10
11		456,276	10,000	24,264	422,012	54,132	144,319	223,561	277,693	111,830	740,684	11
12		456,276	10,000	24,264	422,012	54,120	144,324	223,568	277,688	102,953	843,637	12
13		456,276	10,000	24,264	422,012	54,132	144,319	223,561	277,693	94,784	938,421	13
14		456,276	10,000	24,264	422,012	54,120	144,324	223,568	277,688	87,261	1,025,682	14
15		456,276	10,000	24,264	422,012	54,132	144,319	223,561	277,693	80,337	1,106,020	15
16		456,276	10,000	24,264	422,012	54,120	144,324	223,568	277,688	73,961	1,179,980	16
17		456,276	10,000	24,264	422,012	54,132	144,319	223,561	277,693	68,092	1,248,073	17
18		456,276	10,000	24,264	422,012	54,120	144,324	223,568	277,688	62,687	1,310,760	18
19		456,276	10,000	24,264	422,012	54,132	144,319	223,561	277,693	57,714	1,368,474	19
20		456,276	10,000	24,264	422,012	54,120	144,324	223,568	277,688	53,133	1,421,606	20
21		456,276	10,000	24,264	422,012	27,066	154,937	240,009	267,075	47,046	1,468,653	21
22		456,276	10,000	24,264	422,012	0	165,555	256,457	256,457	41,591	1,510,244	22
23		456,276	10,000	24,264	422,012	0	165,555	256,457	256,457	38,290	1,548,534	23
24		456,276	10,000	24,264	422,012	0	165,555	256,457	256,457	35,252	1,583,785	24
25		456,276	10,000	24,264	422,012	0	165,555	256,457	256,457	32,454	1,616,240	25
26		456,276	10,000	24,264	422,012	0	165,555	256,457	256,457	29,879	1,646,118	26
27		456,276	10,000	24,264	422,012	0	165,555	256,457	256,457	27,507	1,673,625	27
28		456,276	10,000	24,264	422,012	0	165,555	256,457	256,457	25,324	1,698,950	28
29		456,276	10,000	24,264	422,012	0	165,555	256,457	256,457	23,315	1,722,265	29
30		456,276	10,000	24,264	422,012	0	165,555	256,457	256,457	21,464	1,743,729	30
31		456,276	10,000	24,264	422,012	0	165,555	256,457	256,457	19,761	1,763,490	31
32		456,276	10,000	24,264	422,012	0	165,555	256,457	256,457	18,193	1,781,683	32
33		456,276	10,000	24,264	422,012	0	165,555	256,457	256,457	16,749	1,798,432	33
34		456,276	10,000	24,264	422,012	0	165,555	256,457	256,457	15,420	1,813,852	34
35		456,276	10,000	24,264	422,012	0	165,555	256,457	256,457	14,196	1,828,048	35
36		456,276	10,000	24,264	422,012	0	165,555	256,457	256,457	13,070	1,841,118	36
37		456,276	10,000	24,264	422,012	0	165,555	256,457	256,457	12,032	1,853,150	37
38		456,276	10,000	24,264	422,012	0	165,555	256,457	256,457	11,077	1,864,228	38
39		456,276	10,000	24,264	422,012	0	165,555	256,457	256,457	10,198	1,874,426	39
40		456,276	10,000	24,264	422,012	0	165,555	256,457	256,457	9,389	1,883,815	40
41		456,276	10,000	24,264	422,012	0	165,555	256,457	256,457	8,644	1,892,459	41
42		456,276	10,000	24,264	422,012	0	165,555	256,457	256,457	7,958	1,900,417	42
43		456,276	10,000	24,264	422,012	0	165,555	256,457	256,457	7,326	1,907,743	43
44		456,276	10,000	24,264	422,012	0	165,555	256,457	256,457	6,745	1,914,488	44
45		456,276	10,000	24,264	422,012	0	165,555	256,457	256,457	6,210	1,920,698	45
46		456,276	10,000	24,264	422,012	0	165,555	256,457	256,457	5,717	1,926,415	46
47		456,276	10,000	24,264	422,012	0	165,555	256,457	256,457	5,263	1,931,678	47
48		456,276	10,000	24,264	422,012	0	165,555	256,457	256,457	4,846	1,936,524	48
49		456,276	10,000	24,264	422,012	0	165,555	256,457	256,457	4,461	1,940,985	49
50		456,276	10,000	24,264	422,012	0	165,555	256,457	256,457	4,107	1,945,092	50
51		456,276	10,000	24,264	422,012	0	165,555	256,457	256,457	3,781	1,948,873	51
52		456,276	10,000	24,264	422,012	0	165,555	256,457	256,457	3,481	1,952,354	52
53		456,276	10,000	24,264	422,012	0	165,555	256,457	256,457	3,205	1,955,559	53
54		456,276	10,000	24,264	422,012	0	165,555	256,457	256,457	2,950	1,958,509	54
55		456,276	10,000	24,264	422,012	0	165,555	256,457	256,457	2,716	1,961,225	55
56		456,276	10,000	24,264	422,012	0	165,555	256,457	(956,721)	(9,329)	1,951,896	56
Total	1,213,178	25,551,456	560,000	1,358,784	23,632,672	1,213,178	8,795,167	13,624,327	12,411,149	1,951,896	74,704,108	

ConEd Project West Springfield, MA

**PRE-CONSTRUCTION
IRR**



Bay State Gas Company
Westborough, Massachusetts
508-836-7000
<http://www.bgc.com>



Overview

We have the opportunity to increase our 2002 net revenue forecast by a over \$500,000 by providing service to an electric peaking power plant in W. Springfield.

- The Project is *Incremental* to existing goals and forecasts
 - We will meet our current net revenue growth targets *without* this project
 - The project is not included the 2002 Net Revenue Forecast
- The risk is extremely low
 - 10 year agreement signed by Consolidated Edison
 - Annual minimum take or pay agreement (1,250,000 MMBtu)
 - Various penalties, inflation adjustment, buyout clause
 - Prevents a bypass
 - Construction estimate is conservative
- There are significant upside opportunities
 - Potential for future expansion at facility
 - Potential for operation at a higher capacity factor
 - Potential for usage beyond 10 years

Achieving these incremental net revenues will require incremental capital expenditures of \$1.2 million.



ConEd project

The Project

- Requires BSG to upgrade its distribution system in W. Springfield, MA including the "uprate" of existing system from 100 to 275 psig.
- Upgrade also includes Agawam Gate Station, W. Springfield Regulator Station and sleeve on Agawam / W. Springfield bridge.
- Approximately \$1.2 million in capital needed with
- Add minimum 1,250,000 MMBtu annually with guaranteed 10 yr. contract.
- 2 natural gas turbine peaking units
- Special firm transportation agreement.
- requires MDTE approval.

Benefits

- ConEd signed "reimbursement agreement" to cover the cost of "uprate" prior to execution of special firm transportation agreement.
- System upgrade benefits all customers in the area.
- Minimum ROR 14.56%.
- Incremental \$430,000 annual net revenue in 2002.
- Avoids bypass
- Limited risk with MDTE approval, ConEd agreement and parental guarantee.

ConEd would prefer to deal with the local LDC rather than go to the pipeline. ConEd would avoid any bypass opportunity and could position us for further



Financial Analysis

The Con Ed project is a highly attractive growth opportunity in West Springfield.

Scenario 1 - Expected (Total Cost: \$1,200,000)	Financial Impact (10 yr. Term)	Comments
<ul style="list-style-type: none"> Expected annual use 1,500,000 MMBtu 	<ul style="list-style-type: none"> ROR: 19.03% Net Revenues: \$516,000 NPV: \$755,285 Payback: 6 yrs. 	<ul style="list-style-type: none"> Assumes 1,800 hrs. of operation 21% capacity factor Basis: Con Ed's Current Plans
Scenario 2 - Minimum		
<ul style="list-style-type: none"> Minimum annual use 1,250,000 MMBtu 	<ul style="list-style-type: none"> ROR: 14.56% Net Revenues: \$430,000 NPV: \$408,689 Payback: 8 yrs. 	<ul style="list-style-type: none"> Assumes 1,500 hrs. of operation 17% capacity factor Basis: 10 year contract with minimum revenue requirements
Scenario 3 - Maximum		
<ul style="list-style-type: none"> Max annual use 5,050,000 MMBtu 	<ul style="list-style-type: none"> ROR: 61.43% Net Revenues: \$1,737,200 NPV: \$5,676,946 Payback: 2 yrs. 	<ul style="list-style-type: none"> Assumes 6,060 hrs. of operation 70% capacity factor Basis: Maximum MBDQ per agreement and need for electric capacity in the region



This project would increase total capital spending for Bay State Gas by \$ 270 thousand.

2001 Capital Expenditure Impact

•Original Capital Budget	\$ 39.1 million
•ConEd Project	1.15 million
•Capital Offset: Operations	0.25
Granite	0.20
State Project	0.18
Mass. Unbundled	0.25
Total Offsets	0.88
•Projected Capital Spending	\$ 39.37 million

Authorization (above \$250,000)

<u>Title</u>	<u>Signature</u>	<u>Date</u>
Mgr. Bus Dev. / Sales		7/31/01
Dir. Sales & Bus Dev.		7/31/01
VP Operations		8/1/01
VP Finance		8/8/01
VP Finance (Energy Distrib.)		
COO		8/14/01

Massachusetts Internal Rate of Return Commercial

Scenario:

Development Name

Address

Town

Base Case

ConEd

West Springfield

245

Division

Number of Meters

Springfield

Proposed Heat Load Mcf

Proposed Base Load Mcf

Total Load

Rate Schedule (Year 1)

Heat Load per Meter

Base Load per Meter

Load Per Meter

Estimated Costs

Project Estimate

Service

Meter & Fit

Direct Overheads

System Improvements

Marginal Costs

Project Total

Cost per Meter

Cash Flow Results

Yrs

Rate of return - IRR

Customer Contribution

• NPV

• Net Payback (Years)

• Net Gas Revenues

• Net Rate/MMBtu

• Residential Other Revenues/MTR

• Incentives/MTR

Results (Income Basis)

Net Gas Revenues

O&M

Depreciation

Property Taxes

Operating Income

Interest Expense

Income Taxes

Net Income

Rate Schedule (Year 1)

Heat Load per Meter

Base Load per Meter

Load Per Meter

Estimated Costs

Project Estimate

Service

Meter & Fit

Direct Overheads

System Improvements

Marginal Costs

Project Total

Cost per Meter

Cash Flow Results

Yrs

Rate of return - IRR

Customer Contribution

• NPV

• Net Payback (Years)

• Net Gas Revenues

• Net Rate/MMBtu

• Residential Other Revenues/MTR

• Incentives/MTR

Results (Income Basis)

Net Gas Revenues

O&M

Depreciation

Property Taxes

Operating Income

Interest Expense

Income Taxes

Net Income

Year 4
\$462,687
10,000
53,764
43,227
355,696
47,447
120,926
\$187,323

Year 3
\$453,614
10,000
53,764
43,227
346,624
47,447
117,367
\$181,810

Year 2
\$444,720
10,000
53,764
43,227
337,729
47,447
113,878
\$176,404

Year 1
\$436,000
10,000
26,882
43,227
355,891
47,447
121,003
\$187,441

Mass ROR ConEd-10 yr 1250000.xls

ATTACHMENT RR-DTE-136 (a)

Revenue Producing Plants Additions
Account 367 (Mains) > \$100K

List No. 2 (on DTE-3-22 Revised)

POST-CONSTRUCTION

POST CONSTRUCTION - RATE OF RETURN ESTIMATE

WORKPAPER

Project: Gillette Stadium
Foxboro

Capital and O&M Costs

Capital	
Mains	\$ 271,369
Services	23,087
Meters	15,645
Marginal Capital	8,958
Total	\$ 319,059

Meter Counts, Mef Load and Net Revenue

Meter Counts	4
Load (Mcf)	48,760
Net Revenue	\$ 69,505 annual

O & M costs \$ 4,033 annual

Property Tax Rate \$ 15.43 per thousand

Results Summary

* IRR	15 Yrs.
* NPV	10.85%
* Customer Contribution	\$42,646
	\$0

Year	Investment	Revenue	O&M	Property Tax	Profit Before Taxes	Depreciation 20 Year Class	Income Taxes	Total Net Income	Total Net Cash Flow (\$314,580)	P.V. OF Cash Flow (\$314,580)	Payback Calculation (\$314,580)	Payback Period
1	5314,580	\$69,505	\$4,033	\$4,923	\$60,549	\$11,965	\$19,060	\$29,525	\$41,489	38,197	(\$276,383)	1
2		69,505	4,033	4,923	60,549	23,033	14,718	22,799	45,831	38,846	(237,537)	2
3		69,505	4,033	4,923	60,549	21,304	15,396	23,849	45,153	35,234	(202,304)	3
4		69,505	4,033	4,923	60,549	19,708	16,022	24,819	44,527	31,988	(170,316)	4
5		69,505	4,033	4,923	60,549	18,228	16,603	25,719	43,946	29,065	(141,251)	5
6		69,505	4,033	4,923	60,549	16,862	17,138	26,548	43,411	26,437	(114,818)	6
7		69,505	4,033	4,923	60,549	15,596	17,635	27,318	42,914	24,056	(90,762)	7
8		69,505	4,033	4,923	60,549	14,428	18,093	28,028	42,456	21,911	(68,851)	8
9		69,505	4,033	4,923	60,549	14,236	18,168	28,144	42,381	20,136	(48,715)	9
10		69,505	4,033	4,923	60,549	14,233	18,170	28,146	42,379	18,538	(30,177)	10
11		69,505	4,033	4,923	60,549	14,236	18,168	28,144	42,381	17,067	(13,110)	11
12		69,505	4,033	4,923	60,549	14,233	18,170	28,146	42,379	15,712	2,602	12
13		69,505	4,033	4,923	60,549	14,236	18,168	28,144	42,381	14,466	17,067	13
14		69,505	4,033	4,923	60,549	14,233	18,170	28,146	42,379	13,317	30,385	14
15		69,505	4,033	4,923	60,549	14,236	18,168	28,144	42,381	12,261	42,646	15
16		69,505	4,033	0	65,472	14,233	20,101	31,138	45,371	12,084	54,730	16
17	69,505	4,033	0	65,472	14,236	20,100	31,136	45,372	11,126	65,855	17	
18	69,505	4,033	0	65,472	14,233	20,101	31,138	45,371	10,242	76,098	18	
19	69,505	4,033	0	65,472	14,236	20,100	31,136	45,372	9,430	85,528	19	
20	69,505	4,033	0	65,472	14,233	20,101	31,138	45,371	8,681	94,209	20	
21	69,505	4,033	0	65,472	7,118	22,892	35,462	42,580	7,501	101,710	21	
22	69,505	4,033	0	65,472	0	25,685	39,787	39,787	6,453	108,162	22	
23	69,505	4,033	0	65,472	0	25,685	39,787	39,787	5,940	114,103	23	
24	69,505	4,033	0	65,472	0	25,685	39,787	39,787	5,469	119,572	24	
25	69,505	4,033	0	65,472	0	25,685	39,787	39,787	5,035	124,607	25	
26	69,505	4,033	0	65,472	0	25,685	39,787	39,787	4,635	129,242	26	
27	69,505	4,033	0	65,472	0	25,685	39,787	39,787	4,268	133,510	27	
28	69,505	4,033	0	65,472	0	25,685	39,787	39,787	3,929	137,439	28	
29	69,505	4,033	0	65,472	0	25,685	39,787	39,787	3,617	141,056	29	
30	69,505	4,033	0	65,472	0	25,685	39,787	39,787	3,330	144,386	30	
31	69,505	4,033	0	65,472	0	25,685	39,787	39,787	3,066	147,451	31	
32	69,505	4,033	0	65,472	0	25,685	39,787	39,787	2,822	150,274	32	
33	69,505	4,033	0	65,472	0	25,685	39,787	39,787	2,598	152,872	33	
34	69,505	4,033	0	65,472	0	25,685	39,787	39,787	2,392	155,265	34	
35	69,505	4,033	0	65,472	0	25,685	39,787	39,787	2,202	157,467	35	
36	69,505	4,033	0	65,472	0	25,685	39,787	39,787	2,028	159,495	36	
37	69,505	4,033	0	65,472	0	25,685	39,787	39,787	1,867	161,362	37	
38	69,505	4,033	0	65,472	0	25,685	39,787	39,787	1,719	163,080	38	
39	69,505	4,033	0	65,472	0	25,685	39,787	39,787	1,582	164,662	39	
40	69,505	4,033	0	65,472	0	25,685	39,787	39,787	1,457	166,119	40	
41	69,505	4,033	0	65,472	0	25,685	39,787	39,787	1,341	167,460	41	
42	69,505	4,033	0	65,472	0	25,685	39,787	39,787	1,235	168,695	42	
43	69,505	4,033	0	65,472	0	25,685	39,787	39,787	1,137	169,831	43	
44	69,505	4,033	0	65,472	0	25,685	39,787	39,787	1,046	170,878	44	
45	69,505	4,033	0	65,472	0	25,685	39,787	39,787	963	171,841	45	
46	69,505	4,033	0	65,472	0	25,685	39,787	39,787	887	172,728	46	
47	69,505	4,033	0	65,472	0	25,685	39,787	39,787	817	173,545	47	
48	69,505	4,033	0	65,472	0	25,685	39,787	39,787	752	174,296	48	
49	69,505	4,033	0	65,472	0	25,685	39,787	39,787	692	174,988	49	
50	69,505	4,033	0	65,472	0	25,685	39,787	39,787	637	175,626	50	
51	69,505	4,033	0	65,472	0	25,685	39,787	39,787	587	176,212	51	
52	69,505	4,033	0	65,472	0	25,685	39,787	39,787	540	176,752	52	
53	69,505	4,033	0	65,472	0	25,685	39,787	39,787	497	177,249	53	
54	69,505	4,033	0	65,472	0	25,685	39,787	39,787	458	177,707	54	
55	69,505	4,033	0	65,472	0	25,685	39,787	39,787	421	178,129	55	
56	69,505	4,033	0	65,472	0	25,685	39,787	39,787	(274,793)	(2,680)	175,449	56
Total	314,580	3,892,280	225,848	73,846	3,592,586	319,059	1,284,205	1,989,322	1,679,221	175,449	4,373,532	

**Massachusetts Internal Rate of Return
Commercial**

**PRE-CONSTRUCTION
IRR**

Scenario: Base Case
Development Name: Foxboro Stadium CMGI Field
Address: 60 Washington St C5165
Town: 165

Division: Brockton
Number of Meters: 4

Proposed Heat Load Mcf: 40,252
Proposed Base Load Mcf: 8,508
Total Load: 48,760

Rate Schedule (year 1)	V	U
Heat Load per Meter	10,063	
Base Load per Meter	2,127	
Load Per Meter	12,190	

Estimated Cost:
Main: \$192,746
Service: 23,087
Meter & Fit: 15,645
Direct Overheads: 0
System Improvements: 0
Marginal Costs: 4,479
Project Total: \$235,957
Cost per Meter: \$58,989

Cash Flow Results 15 Year Return

Rate of return - IRR: 16.10%
Customer Contribution: \$0
* NPV: \$86,762
* Net Payback (years): 9
* Net Gas Revenues: 69,505
* Net Rate/MMBtu: \$1.43
* Residential Other Revenues/MTR: \$0.00
* Incentives/MTR: \$0.00

Results (Income Basis)

	Year 1	Year 2	Year 3	Year 4
Net Gas Revenues	\$69,505	\$69,505	\$69,505	\$69,505
O&M	4,033	4,033	4,033	4,033
Depreciation	4,719	9,438	9,438	9,438
Property Taxes	3,641	3,641	3,641	3,641
Operating Income	57,112	52,393	52,393	52,393
Interest Expense	8,329	8,329	8,329	8,329
Income Taxes	19,138	17,286	17,286	17,286
Net Income	\$29,645	\$26,778	\$26,778	\$26,778

Massachusetts Internal Rate of Return		
1.] Project Name:	Foxboro Stadium CMGI Field	
2.] Project Location:	60 Washington St C5165	
3.] Town Code:	165	
4.] Base Case = 1 / Best Case = 2	1	Base Case
Residential = 1 / C&I = 2 /		
5.] Combined = 3	2	Commercial
6.] Required Return	10.00%	See note

Customer Code	
C&I	Residential
0	1 Heating
1	2 Non-Heating
2	3 Sub Heating
3	4 Sub Non-Htg
Print Summary	

Town	Foxboro
Division Code	1
Property Tax	\$15.43

6.] [A] Load Data	Year 1	Year 2	Year 3	Year 4
Project Life (years)	15	0	0	0
a. Customer Code	6	0	0	0
b. Heat Load - Mcf/Meter	12,745	0	0	0
c. Base Load - Mcf/Meter	0	0	0	0
d. Meters	2	0	0	0

[B] Load Data	Year 1	Year 2	Year 3	Year 4
Project Life (years)	15	0	0	0
e. Customer Code	3	0	0	0
f. Heat Load - Mcf/Meter	7,381	0	0	0
g. Base Load - Mcf/Meter	4,254	0	0	0
h. Meters	2	0	0	0

Other Variables

Other Revenues - per meter	\$2.66	\$2.66	\$2.66	\$2.66	Res: Customers Only
7.] Incentives or rebates - per meter	\$0	\$0	\$0	\$0	

8.] Investment Cost Data	16.24%	\$215,833	Total
Base Case			
a. Mains	\$192,746	\$0	\$0
b. Services	23,087	0	0
c. Meter & Fit	15,645	0	0
d. Direct Overheads	0	0	0
e. System Improvements (calc)	0	0	0
* Marginal Cost (calc)	4,479	0	0
* Total Investment \$	\$235,957	\$0	\$0
* Cumulative Investment	\$235,957	\$235,957	\$235,957

	55 Years	35 Years	25 Years	15 Years	5 Years
* IRR	16.24%	16.24%	16.10%	12.50%	2.98%
* NPV	\$90,789	\$90,789	\$86,762	\$25,810	(\$73,008)
* Customer Contribution	\$0	\$0	\$0	\$0	\$120,138
* Net Payback (yrs)	9	* Net Revenues	\$69,505		

Capital Authorization Request Form

Bay State Gas Company
D.T.E. 05-27
Attachment RR-DTE-136(a)
Page 14 of 73

Name of Project & Project ID#: Foxboro Stadium/CMGI Field
#1041208

☒ Project over \$50,000

Residential Multi-phased Project
Commercial Multi-phased Project

Sensitivity Analysis

	Description/ Characteristics	Project Cost	ROR/ NPV	Net Revenues /MCF
Expected explain basis for ROR, key assumptions	7200' of 6" plastic main and four services. Uses include under-field heating system to prevent freezing & extend growing season of grass surface. MCF estimate developed in part from real use experience at similar facility--Jack Kent Cooke Stadium, Landover, MD.	\$235,957	16.10% \$86,762	\$69,505 48,760 MCF
Best Case (e.g., future prospects on the main, etc.)	Stadium engineers estimate usage up to 80,000 MCF using macro level assumptions. Potential maintenance facility to be constructed on new main.	\$238,271	25.00% \$229,990	\$102,942 75,000 MCF
Worst Case (e.g., customers we sign up prior to construction, 93% of new construction on the main, etc.)	The customer exercises the minimum take commitment only, which is to consume 43,470 MCF per year for a period of 10 years, yielding net revenues of \$63,149 per year. All natural gas burning equipment specified for this project was designed to burn only natural gas. There are no dual fuel capabilities. The customer agrees to sign a 10 year minimum take agreement.	\$235,507	14.27% \$59,508	\$63,149 43,470 MCF

Expected start date Summer 2001
Expected completion date November 2001
Expected number of phases One
Total number of customers One

Attached: x FIF form
x ROR form (required)
x Construction Estimate (required for all growth projects)

ATTACHMENT RR-DTE-136 (a)

Revenue Producing Plants Additions
Account 367 (Mains) > \$100K

List No. 3 (on DTE-3-22 Revised)

POST CONSTRUCTION - RATE OF RETURN ESTIMATE

WORKPAPER

Project: Spicket Common
Methuen

Total Capital and O&M Costs

Meter Counts, Mcf Load and Net Revenue

Capital			Meter Counts	168
Mains	\$	83,468	Load (Mcf)	12,264
Services		27,149		
Meters		19,256		
Marginal Capital		15,063	Net Revenue	\$ 54,968 annual
Total	\$	144,936		

O & M costs \$ 26,893 annual

Property Tax Rate \$ 22.24 per thousand

Results Summary

55 Yrs.
* IRR 12.26%
* NPV \$56,106
* Customer Contribution \$0

Year	Investment	Revenue	O&M	Property Tax	Profit Before Taxes	Depreciation 20 Year Class	Income Taxes	Total Net Income	Total Net Cash Flow (\$144,936)	P.V. OF Cash Flow (\$144,936)	Payback Calculation (\$144,936)	Payback Period
1	\$144,936	\$54,968	\$26,893	\$3,223	\$24,852	\$5,435	\$7,617	\$11,800	\$12,235	15,867	(\$12,789)	1
2		54,968	26,893	3,223	24,852	10,463	5,645	8,744	19,207	16,280	(98,042)	2
3		54,968	26,893	3,223	24,852	9,677	5,953	9,222	18,899	14,747	(84,670)	3
4		54,968	26,893	3,223	24,852	8,953	6,237	9,662	18,615	13,373	(72,533)	4
5		54,968	26,893	3,223	24,852	8,280	6,501	10,071	18,351	12,137	(61,507)	5
6		54,968	26,893	3,223	24,852	7,660	6,744	10,448	18,108	11,026	(51,483)	6
7		54,968	26,893	3,223	24,852	7,084	6,970	10,797	17,882	10,024	(42,362)	7
8		54,968	26,893	3,223	24,852	6,554	7,178	11,120	17,674	9,121	(33,981)	8
9		54,968	26,893	3,223	24,852	6,067	7,212	11,173	17,640	8,381	(26,265)	9
10		54,968	26,893	3,223	24,852	5,617	7,213	11,173	17,639	7,716	(19,162)	10
11		54,968	26,893	3,223	24,852	5,200	7,212	11,173	17,640	7,104	(12,622)	11
12		54,968	26,893	3,223	24,852	4,813	7,213	11,173	17,639	6,540	(6,601)	12
13		54,968	26,893	3,223	24,852	4,454	7,212	11,173	17,640	6,021	(1,058)	13
14		54,968	26,893	3,223	24,852	4,121	7,213	11,173	17,639	5,543	4,045	14
15		54,968	26,893	3,223	24,852	3,812	7,212	11,173	17,640	5,103	8,743	15
16		54,968	26,893	3,223	24,852	3,526	7,213	11,173	17,639	4,698	13,069	16
17		54,968	26,893	3,223	24,852	3,261	7,212	11,173	17,640	4,325	17,051	17
18		54,968	26,893	3,223	24,852	3,016	7,213	11,173	17,639	3,982	20,717	18
19		54,968	26,893	3,223	24,852	2,790	7,212	11,173	17,640	3,666	24,092	19
20		54,968	26,893	3,223	24,852	2,582	7,213	11,173	17,639	3,375	26,975	20
21		54,968	26,893	3,223	24,852	2,391	8,481	15,138	16,371	2,884	29,425	21
22		54,968	26,893	3,223	24,852	2,216	9,749	15,103	15,103	2,449	31,680	22
23		54,968	26,893	3,223	24,852	2,056	9,749	15,103	15,103	2,255	33,756	23
24		54,968	26,893	3,223	24,852	1,910	9,749	15,103	15,103	2,076	35,667	24
25		54,968	26,893	3,223	24,852	1,777	9,749	15,103	15,103	1,911	37,426	25
26		54,968	26,893	3,223	24,852	1,656	9,749	15,103	15,103	1,760	39,046	26
27		54,968	26,893	3,223	24,852	1,546	9,749	15,103	15,103	1,620	40,538	27
28		54,968	26,893	3,223	24,852	1,446	9,749	15,103	15,103	1,491	41,911	28
29		54,968	26,893	3,223	24,852	1,355	9,749	15,103	15,103	1,373	43,175	29
30		54,968	26,893	3,223	24,852	1,272	9,749	15,103	15,103	1,264	44,338	30
31		54,968	26,893	3,223	24,852	1,196	9,749	15,103	15,103	1,164	45,410	31
32		54,968	26,893	3,223	24,852	1,126	9,749	15,103	15,103	1,071	46,396	32
33		54,968	26,893	3,223	24,852	1,061	9,749	15,103	15,103	986	47,304	33
34		54,968	26,893	3,223	24,852	1,000	9,749	15,103	15,103	908	48,140	34
35		54,968	26,893	3,223	24,852	943	9,749	15,103	15,103	836	48,910	35
36		54,968	26,893	3,223	24,852	890	9,749	15,103	15,103	770	49,618	36
37		54,968	26,893	3,223	24,852	840	9,749	15,103	15,103	709	50,271	37
38		54,968	26,893	3,223	24,852	793	9,749	15,103	15,103	652	50,871	38
39		54,968	26,893	3,223	24,852	749	9,749	15,103	15,103	601	51,424	39
40		54,968	26,893	3,223	24,852	707	9,749	15,103	15,103	553	51,933	40
41		54,968	26,893	3,223	24,852	667	9,749	15,103	15,103	509	52,402	41
42		54,968	26,893	3,223	24,852	628	9,749	15,103	15,103	469	52,833	42
43		54,968	26,893	3,223	24,852	591	9,749	15,103	15,103	431	53,230	43
44		54,968	26,893	3,223	24,852	555	9,749	15,103	15,103	397	53,596	44
45		54,968	26,893	3,223	24,852	521	9,749	15,103	15,103	366	53,933	45
46		54,968	26,893	3,223	24,852	488	9,749	15,103	15,103	337	54,243	46
47		54,968	26,893	3,223	24,852	456	9,749	15,103	15,103	310	54,528	47
48		54,968	26,893	3,223	24,852	426	9,749	15,103	15,103	285	54,791	48
49		54,968	26,893	3,223	24,852	397	9,749	15,103	15,103	263	55,033	49
50		54,968	26,893	3,223	24,852	370	9,749	15,103	15,103	242	55,284	50
51		54,968	26,893	-	28,075	0	11,014	17,061	17,061	252	55,516	51
52		54,968	26,893	-	28,075	0	11,014	17,061	17,061	232	55,729	52
53		54,968	26,893	-	28,075	0	11,014	17,061	17,061	213	55,925	53
54		54,968	26,893	-	28,075	0	11,014	17,061	17,061	196	56,106	54
55		54,968	26,893	0	28,075	0	11,014	17,061	17,061	181	54,859	55
56		54,968	26,893	0	28,075	0	11,014	17,061	(127,875)	(1,247)	902,857	56
Total	144,936	3,078,208	1,506,008	161,150	1,411,050	144,936	496,697	769,417	624,481	54,859		

**Massachusetts Internal Rate of Return
Residential**

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Scenario: **Base Case**
 Development Name Spicket Common Apartments
 Address Methuen
 Town 403

**PRE-CONSTRUCTION
IRR**

Division Lawrence
 Number of Meters 168
 Proposed Heat Load Mcf 7,524
 Proposed Base Load Mcf 4,656
 Total Load 12,180

Rate Schedule (year 1)

Heating	N/A
---------	-----

Heat Load per Meter 45
 Base Load per Meter 28
 Load Per Meter 73

Estimated Cost:

Main \$105,662
 Service 36,000
 Meter & Fit 19,256
 Direct Overheads 0
 System Improvements 0
 Marginal Costs 15,063
 Project Total \$175,981
 Cost per Meter \$1,048

Cash Flow Results

55 Year Return

Rate of return - IRR 10.04%
 Customer Contribution \$0
 * NPV \$26,024
 * Net Payback (years) 22
 * Net Gas Revenues 54,968
 * Net Rate/MMBtu \$4.48
 * Residential Other Revenues/MTR \$2.66
 * Incentives/MTR \$0.00

Results (Income Basis)

	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>
Net Gas Revenues	\$54,968	\$54,968	\$54,968	\$54,968
O&M	26,893	26,893	26,893	26,893
Depreciation	3,520	7,039	7,039	7,039
Property Taxes	3,914	3,914	3,914	3,914
Operating Income	20,642	17,123	17,123	17,123
Interest Expense	6,212	6,212	6,212	6,212
Income Taxes	5,661	5,661	4,280	4,280
Net Income	<u>\$8,769</u>	<u>\$5,250</u>	<u>\$6,631</u>	<u>\$6,631</u>

**PRE-CONSTRUCTION
IRR**

2/8/2005 9:59 AM

Customer Code	
C&I	Residential
Q = 1	Heating
S = 2	Non-Heating
U = 3	Sub. Heating
R = 4	Sub. Non-Htg
T = 5	
V = 6	

Print Summary

Massachusetts Internal Rate of Return	
1.] Project Name:	Spicket Common Apartments
2.] Project Location:	Methuen
3.] Town Code:	403
4.] Base Case = 1 / Best Case = 2	Base Case
Residential = 1 / C&I = 2 /	
5.] Combined = 3	Residential
6.] Required Return	8.62% See note

Town	Methuen
Division Code	4
Property/Tax	\$22.24

6.]	[A] Load Data	Year 1	Year 2	Year 3	Year 4
	Project Life (Years)	55	0	0	0
a.	Customer Code	1	0		
b.	Heat Load - Mcf/Meter	45	0		
c.	Base Load - Mcf/Meter	28	0		
d.	Meters	168	0		

7.]	[B] Load Data	Year 1	Year 2	Year 3	Year 4
	Project Life (Years)	0	0	0	0
e.	Customer Code				
f.	Heat Load - Mcf/Meter				
g.	Base Load - Mcf/Meter				
h.	Meters				

Other Variables						
	Other Revenues - per meter	\$2.66	\$2.66	\$2.66	\$2.66	Res. Customers Only
7.]	Incentives or rebates - per meter	\$0	\$0	\$0	\$0	

8.]	Investment Cost Data	10.04%	\$141,662	Total
	Base Case			Base Case
a.	Mains	\$105,662		\$105,662
b.	Services	36,000	0	36,000
c.	Meter & Fit	19,256	0	19,256
d.	Direct Overheads		0	0
	System Improvements [calc]	0	0	0
	Marginal Cost [calc]	15,063	0	15,063
	Total Investment \$	\$175,981	\$0	\$175,981
	Cumulative Investment	\$175,981	\$175,981	\$175,981

	55 Years	25 Years	15 Years	10 Years	5 Years
IRR	10.04%	9.06%	6.11%	#DIV/0!	-24.32%
NPV	\$26,024	\$6,272	(\$25,223)	(\$55,746)	(\$102,426)
Customer Contribution	\$0	\$0	\$41,505	\$91,733	\$168,547
Net Payback (yrs)	22	* Net Revenues		\$54,968	

Spicket Common ROR.xls

SECTION C. CASH FLOW WORKSHEET - BEST

Year	Investment	Revenue	Other Revenue	Net Revenue	Group 1 Marginal O&M	Group 2 Marginal O&M	Incentives/ Rebates	Property Tax	Profit Before Taxes	Depreciation 20 Year Class	Income Taxes	Total Net Cash Flow	CASH FLOW (175,981)	P.V. OF CASH FLOW (175,981)	Payback Calc NPV (175,981)
1	1	\$54,521	\$447	\$54,968	\$26,893	\$0	\$0	\$3,914	\$24,162	\$6,599	\$6,890	\$17,272	\$15,901	\$15,901	0
2	2	\$54,521	447	54,968	26,893	0	0	3,914	24,162	12,702	4,895	19,666	15,669	15,669	1
3	3	\$54,521	447	54,968	26,893	0	0	3,914	24,162	11,750	4,869	19,293	15,654	15,654	2
4	4	\$54,521	447	54,968	26,893	0	0	3,914	24,162	10,870	5,214	18,947	13,612	13,612	3
5	5	\$54,521	447	54,968	26,893	0	0	3,914	24,162	10,052	5,535	18,626	12,319	12,319	4
6	6	\$54,521	447	54,968	26,893	0	0	3,914	24,162	9,301	5,830	18,332	11,062	11,062	5
7	7	\$54,521	447	54,968	26,893	0	0	3,914	24,162	8,588	6,107	18,052	10,119	10,119	6
8	8	\$54,521	447	54,968	26,893	0	0	3,914	24,162	7,852	6,357	17,805	9,189	9,189	7
9	9	\$54,521	447	54,968	26,893	0	0	3,914	24,162	7,121	6,599	17,603	8,440	8,440	8
10	10	\$54,521	447	54,968	26,893	0	0	3,914	24,162	6,399	6,890	17,400	7,770	7,770	9
11	11	\$54,521	447	54,968	26,893	0	0	3,914	24,162	5,658	7,154	17,203	7,154	7,154	10
12	12	\$54,521	447	54,968	26,893	0	0	3,914	24,162	4,917	7,386	17,009	6,503	6,503	11
13	13	\$54,521	447	54,968	26,893	0	0	3,914	24,162	4,176	7,588	16,826	5,852	5,852	12
14	14	\$54,521	447	54,968	26,893	0	0	3,914	24,162	3,435	7,763	16,652	5,199	5,199	13
15	15	\$54,521	447	54,968	26,893	0	0	3,914	24,162	2,694	7,918	16,487	4,546	4,546	14
16	16	\$54,521	447	54,968	26,893	0	0	3,914	24,162	1,953	8,058	16,332	3,893	3,893	15
17	17	\$54,521	447	54,968	26,893	0	0	3,914	24,162	1,212	8,185	16,187	3,240	3,240	16
18	18	\$54,521	447	54,968	26,893	0	0	3,914	24,162	471	8,300	16,052	2,587	2,587	17
19	19	\$54,521	447	54,968	26,893	0	0	3,914	24,162	0	8,405	15,927	1,934	1,934	18
20	20	\$54,521	447	54,968	26,893	0	0	3,914	24,162	0	8,500	15,812	1,281	1,281	19
21	21	\$54,521	447	54,968	26,893	0	0	3,914	24,162	0	8,585	15,707	628	628	20
22	22	\$54,521	447	54,968	26,893	0	0	3,914	24,162	0	8,669	15,612	0	0	21
23	23	\$54,521	447	54,968	26,893	0	0	3,914	24,162	0	8,753	15,527	0	0	22
24	24	\$54,521	447	54,968	26,893	0	0	3,914	24,162	0	8,837	15,452	0	0	23
25	25	\$54,521	447	54,968	26,893	0	0	3,914	24,162	0	8,921	15,387	0	0	24
26	26	\$54,521	447	54,968	26,893	0	0	3,914	24,162	0	9,005	15,332	0	0	25
27	27	\$54,521	447	54,968	26,893	0	0	3,914	24,162	0	9,089	15,287	0	0	26
28	28	\$54,521	447	54,968	26,893	0	0	3,914	24,162	0	9,173	15,252	0	0	27
29	29	\$54,521	447	54,968	26,893	0	0	3,914	24,162	0	9,257	15,227	0	0	28
30	30	\$54,521	447	54,968	26,893	0	0	3,914	24,162	0	9,341	15,212	0	0	29
31	31	\$54,521	447	54,968	26,893	0	0	3,914	24,162	0	9,425	15,207	0	0	30
32	32	\$54,521	447	54,968	26,893	0	0	3,914	24,162	0	9,509	15,212	0	0	31
33	33	\$54,521	447	54,968	26,893	0	0	3,914	24,162	0	9,593	15,227	0	0	32
34	34	\$54,521	447	54,968	26,893	0	0	3,914	24,162	0	9,677	15,252	0	0	33
35	35	\$54,521	447	54,968	26,893	0	0	3,914	24,162	0	9,761	15,287	0	0	34
36	36	\$54,521	447	54,968	26,893	0	0	3,914	24,162	0	9,845	15,332	0	0	35
37	37	\$54,521	447	54,968	26,893	0	0	3,914	24,162	0	9,929	15,387	0	0	36
38	38	\$54,521	447	54,968	26,893	0	0	3,914	24,162	0	10,013	15,452	0	0	37
39	39	\$54,521	447	54,968	26,893	0	0	3,914	24,162	0	10,097	15,527	0	0	38
40	40	\$54,521	447	54,968	26,893	0	0	3,914	24,162	0	10,181	15,612	0	0	39
41	41	\$54,521	447	54,968	26,893	0	0	3,914	24,162	0	10,265	15,707	0	0	40
42	42	\$54,521	447	54,968	26,893	0	0	3,914	24,162	0	10,349	15,812	0	0	41
43	43	\$54,521	447	54,968	26,893	0	0	3,914	24,162	0	10,433	15,927	0	0	42
44	44	\$54,521	447	54,968	26,893	0	0	3,914	24,162	0	10,517	16,052	0	0	43
45	45	\$54,521	447	54,968	26,893	0	0	3,914	24,162	0	10,601	16,187	0	0	44
46	46	\$54,521	447	54,968	26,893	0	0	3,914	24,162	0	10,685	16,332	0	0	45
47	47	\$54,521	447	54,968	26,893	0	0	3,914	24,162	0	10,769	16,487	0	0	46
48	48	\$54,521	447	54,968	26,893	0	0	3,914	24,162	0	10,853	16,652	0	0	47
49	49	\$54,521	447	54,968	26,893	0	0	3,914	24,162	0	10,937	16,827	0	0	48
50	50	\$54,521	447	54,968	26,893	0	0	3,914	24,162	0	11,021	17,012	0	0	49
51	51	\$54,521	447	54,968	26,893	0	0	3,914	24,162	0	11,105	17,207	0	0	50
52	52	\$54,521	447	54,968	26,893	0	0	3,914	24,162	0	11,189	17,412	0	0	51
53	53	\$54,521	447	54,968	26,893	0	0	3,914	24,162	0	11,273	17,627	0	0	52
54	54	\$54,521	447	54,968	26,893	0	0	3,914	24,162	0	11,357	17,852	0	0	53
55	55	\$54,521	447	54,968	26,893	0	0	3,914	24,162	0	11,441	18,087	0	0	54
56	56	\$54,521	447	54,968	26,893	0	0	3,914	24,162	0	11,525	18,332	0	0	55
57	57	\$54,521	447	54,968	26,893	0	0	3,914	24,162	0	11,609	18,587	0	0	56
58	58	\$54,521	447	54,968	26,893	0	0	3,914	24,162	0	11,693	18,852	0	0	57
59	59	\$54,521	447	54,968	26,893	0	0	3,914	24,162	0	11,777	19,127	0	0	58
60	60	\$54,521	447	54,968	26,893	0	0	3,914	24,162	0	11,861	19,412	0	0	59
61	61	\$54,521	447	54,968	26,893	0	0	3,914	24,162	0	11,945	19,707	0	0	60
62	62	\$54,521	447	54,968	26,893	0	0	3,914	24,162	0	12,029	20,012	0	0	61
63	63	\$54,521	447	54,968	26,893	0	0	3,914	24,162	0	12,113	20,327	0	0	62
64	64	\$54,521	447	54,968	26,893	0	0	3,914	24,162	0	12,197	20,652	0	0	63
65	65	\$54,521	447	54,968	26,893	0	0	3,914	24,162	0	12,281	21,007	0	0	64
66	66	\$54,521	447	54,968	26,893	0	0	3,914	24,162	0	12,365	21,382	0	0	65
67	67	\$54,521	447	54,968	26,893	0	0	3,914	24,162	0	12,449	21,777	0	0	66
68	68	\$54,521	447	54,968	26,893	0	0	3,914	24,162	0	12,533	22,192	0	0	67
69	69	\$54,521	447	54,968	26,893	0	0	3,914	24,162	0	12,617	22,627	0	0	68
70	70	\$54,521	447	54,968	26,893	0	0	3,914	24,162	0	12,701	23,082	0	0	69
71	71	\$54,521	447	54,968	26,893	0	0	3,914	24,162	0	12,785	23,557	0	0	70
72	72	\$54,521	447	54,968	26,893	0	0	3,914	24,162	0	12,869	24,052	0	0	71
73	73	\$54,521	447	54,968	26,893	0	0	3,914	24,162	0	12,953	24,567	0	0	72
74	74	\$54,521	447	54,968	26,893	0	0	3,914	24,162	0	13,037	25,102	0	0	73
75	75	\$54,521	447	54,968	26,893	0	0	3,914	24,162	0	13,121	25,657	0	0	74
76	76	\$54,521	447	54,968	26,893	0	0	3,914	24,162	0	13,205	26,232	0	0	75
77	77	\$54,521	447	54,968	26,893	0	0	3,914	24,162	0	13,289	26,827	0	0	76
78	78	\$54,521	447	54,968	26,893	0	0	3,914	24,162	0	13,373	27,442	0	0	77
79	79	\$54,521	447	54,968	26,893	0	0	3,914	24,162	0	13,457	28,077	0	0	78
80	80	\$54,521	447	54,968	26,893	0	0	3,914	24,162	0	13,541	28,732	0	0	79
81	81	\$54,521	447	54,968	26,893	0	0	3,914	24,162	0	13,625	29,407	0	0	80
82	82	\$54,521	447	54,968	26,893	0	0	3,914	24,162	0	13,709	30,102	0	0	81
83	83	\$54,521	447	54,968	26,893	0	0	3,914	24,162	0	13,793	30,817	0	0	82
84	84	\$54,521	447	54,968	26,893	0	0	3,914	24,162	0	13,877	31,552	0	0	83
85	85	\$54,521	447	54,968	26,893	0	0	3,914	24,162	0					

ATTACHMENT RR-DTE-136 (a)

Revenue Producing Plants Additions
Account 367 (Mains) > \$100K

List No. 4 (on DTE-3-22 Revised)

POST CONSTRUCTION - RATE OF RETURN ESTIMATE

WORKPAPER

Project: Massachusetts Correctional Institute (MCI)
 Bridgewater, MA

Total Capital and O&M Costs

Meter Counts, Mcf Load and Net Revenue

Capital		Meter Counts	
Mains	\$ 1,902,848	Load (Mcf)	185,000
Services	353,812	Net Revenue	\$ 363,000 annual
Meters	42,200		
Marginal Capital	0		
Total	\$ 2,298,860		
O & M costs			
	\$ 6,672 annual		
Property Tax Rate			
	\$ 14.84 per thousand		

Results Summary	
	35 Yrs.
* IRR	10.41%
* NPV	\$397,629
* Customer Contribution	\$0

Year	Investment	Revenue	O&M	Property Tax	Profit Before Taxes	Depreciation 20 Year Class	Income Taxes	Total Net Income	Total Net Cash Flow (\$2,298,860)	P.V. OF Cash Flow (\$2,298,860)	Payback Calculation (\$2,298,860)	Payback Period	
1	\$2,298,860	\$363,000	\$6,672	\$32,836	\$323,492	\$86,207	\$93,087	\$144,198	\$230,405	212,120	(\$2,086,740)	1	
2		363,000	6,672	30,373	325,955	165,955	62,768	97,232	263,187	223,072	(1,863,668)	2	
3		363,000	6,672	28,095	328,233	153,495	68,550	106,188	259,683	202,635	(1,661,033)	3	
4		363,000	6,672	25,988	330,340	142,001	73,886	114,454	256,454	184,235	(1,476,798)	4	
5		363,000	6,672	24,039	332,289	131,334	78,835	122,120	253,454	167,630	(1,309,169)	5	
6		363,000	6,672	22,236	334,092	121,495	83,402	129,195	250,690	152,644	(1,156,525)	6	
7		363,000	6,672	20,568	335,760	112,368	87,637	135,755	248,123	139,091	(1,017,434)	7	
8		363,000	6,672	19,026	337,302	103,954	91,542	141,805	245,760	126,833	(890,601)	8	
9		363,000	6,672	17,563	338,825	102,575	92,681	143,569	246,144	116,950	(773,651)	9	
10		363,000	6,672	15,982	340,346	102,552	93,287	144,507	247,059	108,070	(665,581)	10	
11		363,000	6,672	14,459	341,869	102,575	93,875	145,419	247,994	99,870	(565,712)	11	
12		363,000	6,672	12,937	343,391	102,552	94,481	146,358	248,910	92,284	(473,428)	12	
13		363,000	6,672	11,415	344,913	102,575	95,069	147,269	249,844	85,279	(388,149)	13	
14		363,000	6,672	9,893	346,435	102,552	95,675	148,208	250,760	78,799	(309,350)	14	
15		363,000	6,672	8,371	347,957	102,575	96,263	149,119	251,694	72,816	(236,534)	15	
16		363,000	6,672	6,849	349,479	102,552	96,869	150,057	252,610	67,281	(169,253)	16	
17		363,000	6,672	5,327	351,001	102,575	97,457	150,968	253,544	62,171	(107,082)	17	
18		363,000	6,672	3,805	352,523	102,552	98,064	151,907	254,459	57,444	(49,639)	18	
19		363,000	6,672	2,283	354,045	102,575	98,652	152,818	255,393	53,079	3,440	19	
20		363,000	6,672	761	355,567	102,552	99,258	153,757	256,309	49,042	52,482	20	
21		363,000	6,672	-	356,328	51,288	119,667	185,373	236,661	41,689	94,171	21	
22		363,000	6,672	-	356,328	0	139,787	216,541	216,541	35,118	129,289	22	
23		363,000	6,672	-	356,328	0	139,787	216,541	216,541	32,331	161,619	23	
24		363,000	6,672	-	356,328	0	139,787	216,541	216,541	29,765	191,384	24	
25		363,000	6,672	-	356,328	0	139,787	216,541	216,541	27,403	218,787	25	
26		363,000	6,672	-	356,328	0	139,787	216,541	216,541	25,228	244,015	26	
27		363,000	6,672	-	356,328	0	139,787	216,541	216,541	23,226	267,241	27	
28		363,000	6,672	-	356,328	0	139,787	216,541	216,541	21,383	288,624	28	
29		363,000	6,672	-	356,328	0	139,787	216,541	216,541	19,686	308,210	29	
30		363,000	6,672	-	356,328	0	139,787	216,541	216,541	18,124	326,433	30	
31		363,000	6,672	-	356,328	0	139,787	216,541	216,541	16,685	343,119	31	
32		363,000	6,672	-	356,328	0	139,787	216,541	216,541	15,361	358,480	32	
33		363,000	6,672	-	356,328	0	139,787	216,541	216,541	14,142	372,622	33	
34		363,000	6,672	-	356,328	0	139,787	216,541	216,541	13,020	385,642	34	
35		363,000	6,672	-	356,328	0	139,787	216,541	216,541	11,987	397,629	35	
36		363,000	6,672	-	356,328	0	139,787	216,541	216,541	11,035	408,664	36	
37		363,000	6,672	-	356,328	0	139,787	216,541	216,541	10,160	418,824	37	
38		363,000	6,672	-	356,328	0	139,787	216,541	216,541	9,353	428,177	38	
39		363,000	6,672	-	356,328	0	139,787	216,541	216,541	8,611	436,788	39	
40		363,000	6,672	-	356,328	0	139,787	216,541	216,541	7,928	444,716	40	
41		363,000	6,672	-	356,328	0	139,787	216,541	216,541	7,299	452,014	41	
42		363,000	6,672	-	356,328	0	139,787	216,541	216,541	6,719	458,734	42	
43		363,000	6,672	-	356,328	0	139,787	216,541	216,541	6,186	464,920	43	
44		363,000	6,672	-	356,328	0	139,787	216,541	216,541	5,695	470,615	44	
45		363,000	6,672	-	356,328	0	139,787	216,541	216,541	5,243	475,858	45	
46		363,000	6,672	-	356,328	0	139,787	216,541	216,541	4,827	480,685	46	
47		363,000	6,672	-	356,328	0	139,787	216,541	216,541	4,444	485,129	47	
48		363,000	6,672	-	356,328	0	139,787	216,541	216,541	4,091	489,221	48	
49		363,000	6,672	-	356,328	0	139,787	216,541	216,541	3,767	492,987	49	
50		363,000	6,672	-	356,328	0	139,787	216,541	216,541	3,468	496,455	50	
51		363,000	6,672	-	356,328	0	139,787	216,541	216,541	3,193	499,648	51	
52		363,000	6,672	-	356,328	0	139,787	216,541	216,541	2,939	502,587	52	
53		363,000	6,672	-	356,328	0	139,787	216,541	216,541	2,706	505,293	53	
54		363,000	6,672	-	356,328	0	139,787	216,541	216,541	2,491	507,784	54	
55		363,000	6,672	0	356,328	0	139,787	216,541	216,541	2,294	510,077	55	
56		363,000	6,672	0	356,328	0	139,787	216,541	216,541	(2,082,319)	(20,305)	489,773	56
Total	2,298,860	20,328,000	373,632	312,746	19,641,622	2,298,860	6,803,566	10,539,196	8,240,336	489,773	(3,436,973)		

INTERNAL RATE OF RETURN ANALYSIS

Development Name: MCI Bridgewater
 Location: Bridgewater, MA
 Town: Phase 1 & 2

Avg. Proposed Load Mcf: 318,000

Estimated Cost:

New Main	\$1,374,500
Service	0
Meter & Fit	75,000
Marginal Costs	<u>27,208</u>
Project Total	<u>\$1,476,708</u>

Conversion Costs are expensed \$360,000

Results (Cash Flow Basis)

	<u>35 Yrs.</u>	<u>15 Yrs.</u>	<u>10 Yrs.</u>
Rate of return - IRR	14.48%	11.54%	6.19%
Customer Contribution	\$0	\$0	\$254,007
* NPV	\$849,718	\$246,512	(\$154,360)
* Net Payback (years)	12	12	12
* Net Gas Revenues	\$363,000	\$363,000	\$363,000
* Net Rate/MMBtu	\$1.14	\$1.14	\$1.14

Results (Income Basis)

	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>
Net Gas Revenues	\$160,000	\$363,000	\$363,000	\$363,000
O&M	63,336	304,670	6,672	6,672
Depreciation	6,398	35,932	59,069	59,069
Property Taxes	<u>4,569</u>	<u>21,394</u>	<u>20,433</u>	<u>18,900</u>
Operating Income	85,697	1,004	276,826	278,359
Interest Expense	11,292	52,128	52,128	52,128
Income Taxes	<u>29,189</u>	<u>(20,056)</u>	<u>88,149</u>	<u>88,750</u>
Net Income	<u>\$45,216</u>	<u>(\$31,068)</u>	<u>\$136,549</u>	<u>\$137,481</u>

Project:

MCI Bridgewater
Bridgewater, MA
Phase 1 & 2

PRINT

Year	Capital	Overhead	Total Investment	Revenue	O&M Charge Expense	O&M	Average Property Tax	Discount Rate	Effective Tax Rate	MCF Usage
1	\$308,500	\$11,394	\$319,894	\$160,000	\$60,000	\$3,336	\$14.84	8.75%	39.23%	318,000
2	1,141,000	15,814	1,156,814	363,000	300,000	4,670				
3	0	0	0	363,000	0	6,672				
4	0	0	0	363,000	0	6,672				
5	0	0	0	363,000	0	6,672				
Total	\$1,449,500	\$27,208	\$1,476,708	\$1,612,000	\$360,000	\$28,021				

PRINT

Results Summary				
	35 Yrs.	25 Yrs.	20 Yrs.	15 Yrs.
* IRR	14.48%	14.04%	13.35%	11.54%
* NPV	\$849,718	\$677,142	\$513,366	\$246,512
* Customer Contribut	\$0	\$0	\$0	\$0
				10 Yrs.
				6.19%
				(\$154,360)
				\$254,007

Summary Data	
Total Heat MCF	318,000
Total Base MCF	0
Net Revenues	\$363,000
Net Rate /MMBTU	\$1.14
Net Payback:	12

PRE-CONSTRUCTION

Bay State Gas Company

D.T.E. 05-27
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Year	Investment	Revenue	Contribution	O&M	Property Tax	Profit Before Taxes	Depreciation 20 Year Class	Income Taxes	Total Net Income	Total Net Cash Flow	P.V. OF Cash Flow (\$319,894)	Payback Calculation (\$319,894)	Payback Period
1	\$319,894	\$160,000	\$0	\$63,336	\$4,569	\$92,095	\$11,996	\$31,423	\$48,676	(\$1,096,142)	(1,007,947)	(\$1,327,841)	1
2	1,156,814	363,000	0	304,670	21,394	36,936	66,474	(11,588)	(17,950)	48,524	41,029	(1,286,811)	2
3	0	363,000	0	6,672	20,433	335,895	104,870	90,631	140,394	245,264	190,698	(1,096,113)	3
4	0	363,000	0	6,672	18,900	337,428	97,000	90,631	146,108	243,108	173,813	(922,300)	4
5	0	363,000	0	6,672	17,483	338,845	89,732	97,727	151,386	241,118	158,520	(763,780)	5
6	0	363,000	0	6,672	16,172	340,157	82,995	100,884	156,277	239,272	144,649	(619,131)	6
7	0	363,000	0	6,672	14,959	341,370	76,774	103,801	160,795	237,569	120,631	(487,067)	7
8	0	363,000	0	6,672	13,837	342,491	71,011	106,502	164,979	235,990	110,409	(366,436)	8
9	0	363,000	0	6,672	12,786	343,542	66,585	108,650	168,307	234,892	110,409	(256,027)	9
10	0	363,000	0	6,672	11,798	344,531	65,888	109,312	169,331	235,219	101,667	(154,360)	10
11	0	363,000	0	6,672	10,820	345,508	65,879	109,699	169,931	235,810	93,722	(60,638)	11
12	0	363,000	0	6,672	9,842	346,486	65,888	110,079	170,520	236,407	86,399	25,761	12
13	0	363,000	0	6,672	8,865	347,464	65,879	110,466	171,119	236,998	79,646	105,407	13
14	0	363,000	0	6,672	7,887	348,441	65,888	110,846	171,708	237,595	73,422	178,829	14
15	0	363,000	0	6,672	6,909	349,419	65,879	111,233	172,307	238,186	67,683	246,512	15
16	0	363,000	0	6,672	5,932	350,397	65,888	111,613	172,896	238,784	62,393	308,905	16
17	0	363,000	0	6,672	4,954	351,375	65,879	112,000	173,496	239,375	57,515	366,420	17
18	0	363,000	0	6,672	3,976	352,352	65,888	112,380	174,085	239,972	53,019	419,440	18
19	0	363,000	0	6,672	2,998	353,330	65,879	112,767	174,684	240,563	48,873	468,313	19
20	0	363,000	0	6,672	2,021	354,308	65,888	113,147	175,273	241,160	45,053	513,366	20
21	0	363,000	0	6,672	1,149	355,180	58,742	116,292	180,145	238,887	41,037	554,403	21
22	0	363,000	0	6,672	383	355,945	25,809	129,513	200,624	226,433	35,768	590,171	22
23	0	363,000	0	6,672	0	356,328	0	139,788	216,541	216,541	31,453	621,624	23
24	0	363,000	0	6,672	0	356,328	0	139,788	216,541	216,541	28,923	650,547	24
25	0	363,000	0	6,672	0	356,328	0	139,788	216,541	216,541	26,595	677,142	25
26	0	363,000	0	6,672	0	356,328	0	139,788	216,541	216,541	24,456	701,598	26
27	0	363,000	0	6,672	0	356,328	0	139,788	216,541	216,541	22,488	724,086	27
28	0	363,000	0	6,672	0	356,328	0	139,788	216,541	216,541	20,679	744,765	28
29	0	363,000	0	6,672	0	356,328	0	139,788	216,541	216,541	19,015	763,779	29
30	0	363,000	0	6,672	0	356,328	0	139,788	216,541	216,541	17,485	781,264	30
31	0	363,000	0	6,672	0	356,328	0	139,788	216,541	216,541	16,078	797,342	31
32	0	363,000	0	6,672	0	356,328	0	139,788	216,541	216,541	14,784	812,127	32
33	0	363,000	0	6,672	0	356,328	0	139,788	216,541	216,541	13,595	825,721	33
34	0	363,000	0	6,672	0	356,328	0	139,788	216,541	216,541	12,501	838,222	34
35	0	363,000	0	6,672	0	356,328	0	139,788	216,541	216,541	11,495	849,718	35
36	0	363,000	0	6,672	0	356,328	0	139,788	216,541	216,541	10,570	860,288	36
37	0	363,000	0	6,672	0	356,328	0	139,788	216,541	216,541	9,720	870,008	37
38	0	363,000	0	6,672	0	356,328	0	139,788	216,541	216,541	8,938	878,945	38
39	0	363,000	0	6,672	0	356,328	0	139,788	216,541	216,541	8,219	887,164	39
40	0	363,000	0	6,672	0	356,328	0	139,788	216,541	216,541	7,557	894,721	40
41	0	363,000	0	6,672	0	356,328	0	139,788	216,541	216,541	6,949	901,671	41
42	0	363,000	0	6,672	0	356,328	0	139,788	216,541	216,541	6,390	908,061	42
43	0	363,000	0	6,672	0	356,328	0	139,788	216,541	216,541	5,876	913,937	43
44	0	363,000	0	6,672	0	356,328	0	139,788	216,541	216,541	5,403	919,340	44
Total	1,476,708	15,769,000	0	648,216	218,065	14,902,719	1,476,708	5,267,024	8,158,987	8,158,987	919,340	13,939,200	Total

MCI Bridgewater
Bridgewater, MA
Phase 1 & 2

Year	MCF	Revenue	O&M	Customer Contribution
1	133,000	160,000	2,322	0
2	185,000	203,000	4,350	0
3	0	0	0	0
4	0	0	0	0
5	0	0	0	0
6	0	0	0	0
7	0	0	0	0
8	0	0	0	0
9	0	0	0	0
10	0	0	0	0
11	0	0	0	0
Total	318,000	363,000	6,672	0

Capital Inv.	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Main	233,500	1,141,000	0	0	0	1,374,500
Service	0	0	0	0	0	0
Meter	15,000	0	0	0	0	15,000
Other	60,000	0	0	0	0	60,000
Total Cap. Inv.	308,500	1,141,000	0	0	0	1,449,500

Costs Expensed 60,000 300,000

Property Taxes	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Year 1	248,500	14.84	0.085	3,855.51	0	0
Year 2	1,141,000	14.84	11,305	17,165.80	0	0
Year 3	0	0	15,725	0.00	0	0
Year 4	0	0	0	0.00	0	0
Year 5	0	0	0	0.00	0	0
Year 6	0	0	0	0.00	0	0
Total	1,389,500	14.84	27,030	21,021.31	0	0

ATTACHMENT RR-DTE-136 (a)

Revenue Producing Plants Additions
Account 367 (Mains) > \$100K

List No. 5 (on DTE-3-22 Revised)

POST CONSTRUCTION - RATE OF RETURN ESTIMATE

WORKPAPER

Project: Brooks School, Great Pond Road
Lawrence

Total Capital and O&M Costs

Meter Counts, Mef Load and Net Revenue

Capital		Meter Counts	
Mains	\$ 134,689	Load (Mcf)	24,487
Services	7,396		
Meters	3,802		
Marginal Capital	2,165	Net Revenue	\$ 31,771 annual
Total	\$ 148,052		
O & M costs	\$ 1,869 annual		
Property Tax Rate	\$ 16.35 per thousand		

Results Summary

* IRR	15 Yrs.
* NPV	10.25%
* Customer Contribution	\$14,627
	\$0

Year	Investment	Revenue	O&M	Property Tax	Profit Before Taxes	Depreciation 20 Year Class	Income Taxes	Total Net Income	Total Net Cash Flow (\$148,052)	P.V. OF Cash Flow (\$148,052)	Payback Calculation (\$148,052)	Payback Period
1	\$148,052	\$31,771	\$1,869	\$2,421	\$27,481	\$5,552	\$8,603	\$13,326	\$18,878	17,380	(\$130,672)	1
2		31,771	1,869	2,421	27,481	10,688	6,588	10,205	20,893	17,709	(112,963)	2
3		31,771	1,869	2,421	27,481	9,885	6,903	10,693	20,578	16,058	(96,906)	3
4		31,771	1,869	2,421	27,481	9,145	7,193	11,143	20,288	14,575	(82,331)	4
5		31,771	1,869	2,421	27,481	8,458	7,463	11,560	20,018	13,240	(69,092)	5
6		31,771	1,869	2,421	27,481	7,825	7,711	11,945	19,770	12,018	(57,054)	6
7		31,771	1,869	2,421	27,481	7,237	7,942	12,302	19,539	10,953	(46,101)	7
8		31,771	1,869	2,421	27,481	6,695	8,154	12,632	19,327	9,974	(36,127)	8
9		31,771	1,869	2,421	27,481	6,606	8,189	12,686	19,292	9,166	(26,960)	9
10		31,771	1,869	2,421	27,481	6,605	8,190	12,687	19,291	8,438	(18,522)	10
11		31,771	1,869	2,421	27,481	6,606	8,189	12,686	19,292	7,769	(10,753)	11
12		31,771	1,869	2,421	27,481	6,605	8,190	12,687	19,291	7,152	(3,601)	12
13		31,771	1,869	2,421	27,481	6,606	8,189	12,686	19,292	6,585	2,984	13
14		31,771	1,869	2,421	27,481	6,605	8,190	12,687	19,291	6,062	9,046	14
15		31,771	1,869	2,421	27,481	6,606	8,189	12,686	19,292	5,581	14,627	15
16		31,771	1,869	2,421	27,481	6,605	8,190	12,687	19,291	5,138	19,765	16
17		31,771	1,869	2,421	27,481	6,606	8,189	12,686	19,292	4,730	24,496	17
18		31,771	1,869	2,421	27,481	6,605	8,190	12,687	19,291	4,355	28,851	18
19		31,771	1,869	2,421	27,481	6,606	8,189	12,686	19,292	4,009	32,860	19
20		31,771	1,869	2,421	27,481	6,605	8,190	12,687	19,291	3,691	36,551	20
21		31,771	1,869	2,421	27,481	3,303	9,485	14,693	17,996	3,170	39,722	21
22		31,771	1,869	2,421	27,481	0	10,781	16,700	16,700	2,708	42,430	22
23		31,771	1,869	2,421	27,481	0	10,781	16,700	16,700	2,493	44,923	23
24		31,771	1,869	2,421	27,481	0	10,781	16,700	16,700	2,296	47,219	24
25		31,771	1,869	2,421	27,481	0	10,781	16,700	16,700	2,112	49,332	25
26		31,771	1,869	2,421	27,481	0	10,781	16,700	16,700	1,946	51,278	26
27		31,771	1,869	2,421	27,481	0	10,781	16,700	16,700	1,791	53,069	27
28		31,771	1,869	2,421	27,481	0	10,781	16,700	16,700	1,649	54,718	28
29		31,771	1,869	2,421	27,481	0	10,781	16,700	16,700	1,518	56,236	29
30		31,771	1,869	2,421	27,481	0	10,781	16,700	16,700	1,398	57,634	30
31		31,771	1,869	2,421	27,481	0	10,781	16,700	16,700	1,287	58,921	31
32		31,771	1,869	2,421	27,481	0	10,781	16,700	16,700	1,185	60,106	32
33		31,771	1,869	2,421	27,481	0	10,781	16,700	16,700	1,091	61,196	33
34		31,771	1,869	2,421	27,481	0	10,781	16,700	16,700	1,004	62,201	34
35		31,771	1,869	2,421	27,481	0	10,781	16,700	16,700	924	63,125	35
36		31,771	1,869	2,421	27,481	0	10,781	16,700	16,700	851	63,976	36
37		31,771	1,869	2,421	27,481	0	10,781	16,700	16,700	784	64,760	37
38		31,771	1,869	2,421	27,481	0	10,781	16,700	16,700	721	65,481	38
39		31,771	1,869	2,421	27,481	0	10,781	16,700	16,700	664	66,145	39
40		31,771	1,869	2,421	27,481	0	10,781	16,700	16,700	611	66,756	40
41		31,771	1,869	2,421	27,481	0	10,781	16,700	16,700	563	67,319	41
42		31,771	1,869	2,421	27,481	0	10,781	16,700	16,700	518	67,838	42
43		31,771	1,869	2,421	27,481	0	10,781	16,700	16,700	477	68,315	43
44		31,771	1,869	2,421	27,481	0	10,781	16,700	16,700	439	68,754	44
45		31,771	1,869	2,421	27,481	0	10,781	16,700	16,700	404	69,158	45
46		31,771	1,869	2,421	27,481	0	10,781	16,700	16,700	372	69,531	46
47		31,771	1,869	2,421	27,481	0	10,781	16,700	16,700	343	69,873	47
48		31,771	1,869	2,421	27,481	0	10,781	16,700	16,700	316	70,189	48
49		31,771	1,869	2,421	27,481	0	10,781	16,700	16,700	290	70,479	49
50		31,771	1,869	2,421	27,481	0	10,781	16,700	16,700	267	70,747	50
51		31,771	1,869	2,421	27,481	0	10,781	16,700	16,700	246	70,993	51
52		31,771	1,869	2,421	27,481	0	10,781	16,700	16,700	227	71,220	52
53		31,771	1,869	2,421	27,481	0	10,781	16,700	16,700	209	71,428	53
54		31,771	1,869	2,421	27,481	0	10,781	16,700	16,700	192	71,620	54
55		31,771	1,869	2,421	27,481	0	10,781	16,700	16,700	177	71,797	55
56		31,771	1,869	2,421	27,481	0	10,781	16,700	(131,352)	(1,281)	70,517	56
Total	148,052	1,779,176	104,664	135,576	1,538,936	148,052	545,644	845,240	697,188	70,517	1,579,054	

**Massachusetts Internal Rate of Return
Commercial**

Bay State Gas Company
D.T.E. 05-27
Attachment RR-DTE-136(a)
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Scenario:
Development Name
Address
Town

Base Case
Brooks School
1600 Great Pond Rd.
404

**PRE-CONSTRUCTION
IRR**

Division
Number of Meters

Proposed Heat Load Mcf
Proposed Base Load Mcf
Total Load

Lawrence
1

24,276
1,500
25,776

Rate Schedule (year 1)

V	N/A
---	-----

Heat Load per Meter
Base Load per Meter
Load Per Meter

24,276
1,500
25,776

Estimated Cost:

Main
Service
Meter & Fit
Direct Overheads
System Improvements
Marginal Costs
Project Total
Cost per Meter

\$126,613
8,675
3,802
0
0
2,274
\$141,364
\$141,364

Cash Flow Results

15 Year Return

Rate of return - IRR
Customer Contribution
* NPV
* Net Payback (years)
* Net Gas Revenues
* Net Rate/MMBtu
* Residential Other Revenues/MTR
* Incentives/MTR

11.96%
\$0
\$27,797
11
33,532
\$1.30
\$0.00
\$0.00

Results (Income Basis)

	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>
Net Gas Revenues	\$33,532	\$33,532	\$33,532	\$33,532
O&M	1,959	1,959	1,959	1,959
Depreciation	2,827	5,655	5,655	5,655
Property Taxes	2,311	2,311	2,311	2,311
Operating Income	26,434	23,606	23,606	23,606
Interest Expense	4,990	4,990	4,990	4,990
Income Taxes	8,413	7,303	7,303	7,303
Net Income	\$13,031	\$11,313	\$11,313	\$11,313

PRE-CONSTRUCTION IRR

Massachusetts Internal Rate of Return		
1.] Project Name:	Brooks School	
2.] Project Location:	1600 Great Pond Rd.	
3.] Town Code:	404	
4.] Base Case = 1 / Best Case = 2	1	Base Case
Residential = 1 / C&I = 2 / Combined =		
5.] 3	2	Commercial

Town	North Andover
Division Code	4
Property Tax	\$16.35

C&I	Customer Code
0 = 1	Residential
S = 2	Heating
0 = 3	Non-Heating
R = 4	Sub-Heating
T = 5	Sub-Non-Htg
V = 6	
Print Summary	

Bay State Gas Company
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6.] [A] Load Data	Year 1	Year 2	Year 3	Year 4
Project Life (years)	15	0	0	0
a. Customer Code	6	0	0	0
b. Heat Load - Mcf/Meter	24,276	0	0	0
c. Base Load - Mcf/Meter	1,500	0	0	0
d. Meters	1	0	0	0

[B] Load Data	Year 1	Year 2	Year 3	Year 4
Project Life (years)	0	0	0	0
e. Customer Code	0	0	0	0
f. Heat Load - Mcf/Meter	0	0	0	0
g. Base Load - Mcf/Meter	0	0	0	0
h. Meters	0	0	0	0

Other Variables					
Other Revenues - per meter	\$2.66	\$2.66	\$2.66	\$2.66	Res. Customers On
7.] Incentives or rebates - per meter	\$0	\$0	\$0	\$0	

8.] Investment Cost Data	Total				
Base Case	Base Case				
a. Mains	\$126,613	\$0	\$0	\$0	\$126,613
b. Services	8,675	0	0	0	8,675
c. Meter & Fit	3,802	0	0	0	3,802
d. Direct Overheads	0	0	0	0	0
* System Improvements (calc)	0	0	0	0	0
* Marginal Cost (calc)	2,274	0	0	0	2,274
* Total Investment \$	\$141,364	\$0	\$0	\$0	\$141,364
* Cumulative Investment	\$141,364	\$141,364	\$141,364	\$141,364	\$141,364

	55 Years	35 Years	15 Years	10 Years
* IRR	12.19%	12.19%	11.96%	7.70%
* NPV	\$30,762	\$30,762	\$27,797	(\$6,480)
* Customer Contribution	\$0	\$0	\$0	\$10,663
* Net Payback (yrs)	11	* Net Revenues		\$33,532

ATTACHMENT RR-DTE-136 (a)

Revenue Producing Plants Additions
Account 367 (Mains) > \$100K

List No. 6 (on DTE-3-22 Revised)

POST CONSTRUCTION - RATE OF RETURN ESTIMATE

WORKPAPER

Project: The Loop, Oak Street
Methuen

Total Capital and O&M Costs

Meter Counts, Mcf Load and Net Revenue

Capital			Meter Counts	29
Mains	\$	78,001	Load (Mcf)	34,470
Services		13,806		
Meters		24,718		
Marginal Capital		7,063	Net Revenue	\$ 74,565 annual
Total	\$	123,588		
O & M costs	\$	14,221 annual		
Property Tax Rate	\$	22.40 per thousand		

Results Summary

35 Yrs.

* IRR	30.44%
* NPV	\$283,357
* Customer Contribution	\$0

Year	Investment	Revenue	O&M	Property Tax	Profit Before Taxes	Depreciation 20 Year Class	Income Taxes	Total Net Income	Total Net Cash Flow (\$123,588)	P V. OF Cash Flow (\$123,588)	Payback Calculation (\$123,588)	Payback Period
1	\$123,588	\$74,565	\$14,221	\$2,768	\$57,576	\$4,635	\$20,769	\$32,173	\$36,807	33,886	(57,079)	0
2		74,565	14,221	2,768	57,576	8,922	19,087	29,567	38,489	32,622	(27,251)	2
3		74,565	14,221	2,768	57,576	8,252	19,350	29,974	38,226	29,829	36	3
4		74,565	14,221	2,768	57,576	7,634	19,592	30,350	37,984	27,287	47,874	4
5		74,565	14,221	2,768	57,576	7,061	19,817	30,698	37,759	24,973	25,009	5
6		74,565	14,221	2,768	57,576	6,532	20,025	31,020	37,551	22,865	68,816	6
7		74,565	14,221	2,768	57,576	6,041	20,217	31,318	37,359	20,942	88,005	7
8		74,565	14,221	2,768	57,576	5,589	20,395	31,593	37,181	19,189	105,657	8
9		74,565	14,221	2,768	57,576	5,114	20,424	31,638	37,152	17,652	121,908	9
10		74,565	14,221	2,768	57,576	5,513	20,424	31,639	37,152	16,251	136,870	10
11		74,565	14,221	2,768	57,576	5,514	20,424	31,638	37,152	14,962	150,644	11
12		74,565	14,221	2,768	57,576	5,513	20,424	31,639	37,152	13,774	163,325	12
13		74,565	14,221	2,768	57,576	5,514	20,424	31,638	37,152	12,681	175,006	13
14		74,565	14,221	2,768	57,576	5,513	20,424	31,639	37,152	11,675	185,748	14
15		74,565	14,221	2,768	57,576	5,514	20,424	31,638	37,152	10,748	195,643	15
16		74,565	14,221	2,768	57,576	5,513	20,424	31,639	37,152	9,895	204,753	16
17		74,565	14,221	2,768	57,576	5,514	20,424	31,638	37,152	9,110	213,140	17
18		74,565	14,221	2,768	57,576	5,513	20,424	31,639	37,152	8,387	220,801	18
19		74,565	14,221	2,768	57,576	5,514	20,424	31,638	37,152	7,721	227,970	19
20		74,565	14,221	2,768	57,576	5,513	20,424	31,639	37,152	7,109	234,324	20
21		74,565	14,221	2,768	57,576	2,757	21,505	33,313	36,071	6,354	239,998	21
22		74,565	14,221	2,768	57,576	0	22,587	34,989	34,989	5,674	245,222	22
23		74,565	14,221	2,768	57,576	0	22,587	34,989	34,989	5,224	250,032	23
24		74,565	14,221	2,768	57,576	0	22,587	34,989	34,989	4,809	254,460	24
25		74,565	14,221	2,768	57,576	0	22,587	34,989	34,989	4,428	258,536	25
26		74,565	14,221	2,768	57,576	0	22,587	34,989	34,989	4,076	262,289	26
27		74,565	14,221	2,768	57,576	0	22,587	34,989	34,989	3,753	265,744	27
28		74,565	14,221	2,768	57,576	0	22,587	34,989	34,989	3,455	268,925	28
29		74,565	14,221	2,768	57,576	0	22,587	34,989	34,989	3,181	271,853	29
30		74,565	14,221	2,768	57,576	0	22,587	34,989	34,989	2,928	274,540	30
31		74,565	14,221	2,768	57,576	0	22,587	34,989	34,989	2,696	277,031	31
32		74,565	14,221	2,768	57,576	0	22,587	34,989	34,989	2,482	279,316	32
33		74,565	14,221	2,768	57,576	0	22,587	34,989	34,989	2,285	281,420	33
34		74,565	14,221	2,768	57,576	0	22,587	34,989	34,989	2,104	283,357	34
35		74,565	14,221	2,768	57,576	0	22,587	34,989	34,989	1,937	285,140	35
36		74,565	14,221	2,768	57,576	0	22,587	34,989	34,989	1,783	286,782	36
37		74,565	14,221	2,768	57,576	0	22,587	34,989	34,989	1,642	288,293	37
38		74,565	14,221	2,768	57,576	0	22,587	34,989	34,989	1,511	289,684	38
39		74,565	14,221	2,768	57,576	0	22,587	34,989	34,989	1,391	290,965	39
40		74,565	14,221	2,768	57,576	0	22,587	34,989	34,989	1,281	292,145	40
41		74,565	14,221	2,768	57,576	0	22,587	34,989	34,989	1,179	293,230	41
42		74,565	14,221	2,768	57,576	0	22,587	34,989	34,989	1,086	294,230	42
43		74,565	14,221	2,768	57,576	0	22,587	34,989	34,989	1,000	295,150	43
44		74,565	14,221	2,768	57,576	0	22,587	34,989	34,989	920	295,997	44
45		74,565	14,221	2,768	57,576	0	22,587	34,989	34,989	847	296,777	45
46		74,565	14,221	2,768	57,576	0	22,587	34,989	34,989	780	297,496	46
47		74,565	14,221	2,768	57,576	0	22,587	34,989	34,989	718	298,157	47
48		74,565	14,221	2,768	57,576	0	22,587	34,989	34,989	661	298,765	48
49		74,565	14,221	2,768	57,576	0	22,587	34,989	34,989	609	299,326	49
50		74,565	14,221	2,768	57,576	0	22,587	34,989	34,989	560	299,841	50
51		74,565	14,221	2,768	57,576	0	22,587	34,989	34,989	516	300,316	51
52		74,565	14,221	2,768	57,576	0	22,587	34,989	34,989	475	300,754	52
53		74,565	14,221	2,768	57,576	0	22,587	34,989	34,989	437	301,156	53
54		74,565	14,221	2,768	57,576	0	22,587	34,989	34,989	403	301,527	54
55		74,565	14,221	2,768	57,576	0	22,587	34,989	34,989	371	300,663	55
56		74,565	14,221	2,768	57,576	0	22,587	34,989	(88,599)	(864)	12,187,091	56
Total	123,588	4,175,640	796,376	155,008	3,224,256	123,588	1,216,392	1,884,276	1,760,688	300,663		

Date:

09-Jun-99

INTERNAL RATE OF RETURN ANALYSIS

Development Name: THE LOOP ENTERTAINMENT
Location: PLEASANT STREET
Town: METHUEN, MA

Heat Load Mcf: 23,410
Base Load Mcf: 11,060
Avg. Proposed Load Mcf: 34,470

Estimated Cost:
New Main \$161,014
Service 4,500
Meter & Fit 24,718
Marginal Costs 12,936
Project Total \$203,168

Results (Cash Flow Basis)

Rate of return - IRR 15 Yrs. 10 Yrs. 5 Yrs.
Customer Contribution 17.02% 13.56% -1.65%
* NPV \$0 \$0 \$71,774
* Net Payback (years) 8 8 8
* Net Gas Revenues \$108,421 \$44,997 (\$52,085)
* Net Rate/MMBtu \$74,565 \$74,565 \$74,565
\$1.29 \$2.16 \$2.16

Results (Income Basis)

	Year 1	Year 2	Year 3	Year 4
Net Gas Revenues	\$74,565	\$74,565	\$74,565	\$74,565
O&M	14,221	14,221	14,221	14,221
Depreciation	3,805	7,609	7,609	7,609
Property Taxes	4,518	4,518	4,518	4,518
Operating Income	52,021	48,217	48,217	48,217
Interest Expense	6,715	6,715	6,715	6,715
Income Taxes	17,773	16,281	16,281	16,281
Net Income	\$27,532	\$25,220	\$25,220	\$25,220

PRE-CONSTRUCTION
IRR

Bay State Gas Company
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PRE-CONSTRUCTION IRR

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THE LOOP ENTERTAINMENT
PLEASANT STREET
METHUEN, MA

METHUEN, MA									
METER	Customer					Usage		Usage	
	MCF	Revenue	O&M	Service Cost	Meter & Fit	Contribution	Rate Class	Heat	Base
Home Depot	5,700	12,989	3,447	500	3,802	0	V	5,472	228
Stop & Shop	3,900	8,220	659	500	2,719	0	T	2,730	1,170
Retail 1	683	2,118	659	500	1,709	0	T	612	71
Retail 2	390	1,317	219	0	298	0	R	293	98
Retail 3	390	1,317	219	0	298	0	R	293	98
Retail 4	650	2,016	659	0	1,709	0	T	488	163
Retail 5	94	518	219	0	116	0	R	71	24
Retail 6	88	498	219	0	116	0	R	66	22
Ice Cream	51	342	197	0	116	0	Q	15	36
Cafe 1	644	1,673	530	0	1,128	0	S	193	451
Theatre	6,600	14,576	3,447	500	3,802	0	V	6,000	600
Retail 7	644	1,673	530	500	128	0	S	193	451
Retail 8	168	732	219	0	116	0	R	168	0
Retail 9	168	732	219	0	116	0	R	168	0
Retail 10	900	2,479	530	0	1,709	0	S	500	400
Restaurant	1,600	3,018	530	500	1,709	0	S	300	1,300
Restaurant	1,600	3,018	530	500	1,709	0	S	300	1,300
Restaurant	1,600	3,018	530	500	1,709	0	S	300	1,300
Retail 11	600	1,941	659	500	1,709	0	T	550	50
Parlex Incremental	8,000	12,370	0	0	0	0	V	4,700	3,300
Total	34,470	74,565	14,221	4,500	24,718	0	0	23,410	11,060

CAPITAL INV	Year					Total
	Year 1	Year 2	Year 3	Year 4	Year 5	
MAIN	161,014	0	0	0	0	161,014
SERVICE	4,500	0	0	0	0	4,500
METER	24,718	0	0	0	0	24,718
OTHER	0	0	0	0	0	0
TOTAL INV.	190,232	0	0	0	0	190,232

Property Taxes						
Methuen	190,232	22.24	12,936	4,518.45		
Town 2	0		0	0.00		
Town 3	0		0	0.00		
Town 4	0		0	0.00		
Town 5	0		0	0.00		
Town 6	0		0	0.00		
	190,232	22.24	12,936	4,518.45		

PRINT

THE LOOP ENTERTAINMENT
PLEASANT STREET
METHUEN, MA

Project:

Year	Capital	Marginal	Total Investment	Revenue	Customer Contribution	O&M	Property Tax	Average Property Tax	Discount Rate	Effective Tax Rate	MCF Usage
1	\$190,232	\$12,936	\$203,168	\$74,565	\$0	\$14,221	\$22.24	\$22.24	8.75%	39.23%	34,470
2	0	0	0	74,565	0	14,221					23,410
3	0	0	0	74,565	0	14,221					11,060
4	0	0	0	74,565	0	14,221					
5	0	0	0	74,565	0	14,221					
Total	\$190,232	\$12,936	\$203,168	\$372,825	\$0	\$71,105					

Results Summary

	25 Yrs	20 Yrs	15 Yrs	10 Yrs	5 Yrs
* IRR	18.48%	18.11%	17.02%	13.56%	1.65%
* NPV	\$175,236	\$150,118	\$108,421	\$44,997	(\$52,085)
* Customer Contribution	\$0	\$0	\$0	\$0	\$71,174

Summary Data

Total Heat MCF	34,470	Net Rate / MMBTU	\$1.29
Total Base MCF	23,410	Net Payback	8
Net Revenues	\$74,565		

PRE-CONSTRUCTION IRR

Bay State Gas Company
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Year	Investment	Revenue	Contribution	O&M	Property Tax	Before Taxes	Profit	Depreciation	Income Taxes	Total Net Income	Total Net Cash Flow	P.V. OF Cash Flow	Payback Calculation	Payback Period
1	\$203,168	\$74,565	\$0	\$14,221	\$4,518	\$55,826	\$55,826	\$7,619	\$18,912	\$29,295	\$36,914	\$33,944	(\$203,168)	0
2	0	74,565	0	14,221	4,518	55,826	55,826	14,667	16,147	25,012	39,679	33,551	(\$169,224)	1
3	0	74,565	0	14,221	4,518	55,826	55,826	13,566	16,579	25,681	39,247	30,515	(135,673)	2
4	0	74,565	0	14,221	4,518	55,826	55,826	12,550	16,977	26,299	38,848	27,775	(105,158)	3
5	0	74,565	0	14,221	4,518	55,826	55,826	11,607	17,347	26,872	38,479	25,297	(77,383)	4
6	0	74,565	0	14,221	4,518	55,826	55,826	10,737	17,688	27,400	38,137	23,056	(52,085)	5
7	0	74,565	0	14,221	4,518	55,826	55,826	9,931	18,004	27,890	37,821	21,025	(29,030)	6
8	0	74,565	0	14,221	4,518	55,826	55,826	9,187	18,296	28,342	37,529	19,164	(8,005)	7
9	0	74,565	0	14,221	4,518	55,826	55,826	8,465	18,544	28,416	37,482	17,618	11,179	8
10	0	74,565	0	14,221	4,518	55,826	55,826	7,763	18,745	28,417	37,481	16,200	28,797	9
11	0	74,565	0	14,221	4,518	55,826	55,826	7,083	18,945	28,416	37,482	14,897	44,997	10
12	0	74,565	0	14,221	4,518	55,826	55,826	6,403	19,145	28,417	37,481	13,698	59,893	11
13	0	74,565	0	14,221	4,518	55,826	55,826	5,723	19,345	28,416	37,482	12,596	73,591	12
14	0	74,565	0	14,221	4,518	55,826	55,826	5,043	19,545	28,417	37,481	11,582	86,188	13
15	0	74,565	0	14,221	4,518	55,826	55,826	4,363	19,745	28,416	37,481	10,651	97,770	14
16	0	74,565	0	14,221	4,518	55,826	55,826	3,683	19,945	28,417	37,482	9,794	108,421	15
17	0	74,565	0	14,221	4,518	55,826	55,826	3,003	20,145	28,416	37,481	8,906	118,214	16
18	0	74,565	0	14,221	4,518	55,826	55,826	2,323	20,345	28,417	37,482	8,081	127,220	17
19	0	74,565	0	14,221	4,518	55,826	55,826	1,643	20,545	28,416	37,481	7,261	135,501	18
20	0	74,565	0	14,221	4,518	55,826	55,826	9,063	20,745	28,417	37,482	6,433	143,116	19
21	0	74,565	0	14,221	4,518	55,826	55,826	8,383	20,945	28,417	37,481	5,615	150,118	20
22	0	74,565	0	14,221	4,518	55,826	55,826	7,703	21,145	28,416	35,703	4,794	156,251	21
23	0	74,565	0	14,221	4,518	55,826	55,826	7,023	21,345	28,417	33,925	3,976	161,610	22
24	0	74,565	0	14,221	4,518	55,826	55,826	6,343	21,545	28,416	33,925	3,158	166,538	23
25	0	74,565	0	14,221	4,518	55,826	55,826	5,663	21,745	28,417	33,925	2,340	171,069	24
Total	\$203,168	\$1,864,125	\$0	\$355,525	\$112,961	\$1,395,639	\$1,395,639	\$203,168	\$48,806	\$724,865	\$724,865	\$1,235,381	\$1,235,381	Total

ATTACHMENT RR-DTE-136 (a)

Revenue Producing Plants Additions
Account 367 (Mains) > \$100K

List No. 7 (on DTE-3-22 Revised)

POST-CONSTRUCTION

Bay State Gas Company
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POST CONSTRUCTION - RATE OF RETURN ESTIMATE

Project: Van Sickle School & Police/Fire Complex
Springfield

Results Summary					
	55 Yrs.	35 Yrs.	15 Yrs.	10 Yrs.	5 Yrs.
* IRR	12.06%	11.85%	8.52%	3.39%	-15.18%
* NPV	\$48,912	\$41,257	(\$1,396)	(\$29,043)	(\$69,670)
* Customer Contribution	\$0	\$0	\$2,252	\$46,844	\$112,372

Year	Investment	Revenue	O&M	Property Tax	Profit Before Taxes	Depreciation 20 Year Class	Income Taxes	Total Net Income	Total Net Cash Flow (\$126,637)	P.V. OF Cash Flow (\$126,637)	Payback Calculation (\$126,637)	Payback Period
1	\$126,637	\$19,568	\$1,227	\$4,665	\$13,676	\$4,749	\$3,392	\$5,335	\$10,284	9,460	(\$117,177)	0
2	0	26,095	1,557	4,490	20,048	9,142	4,144	6,762	15,903	13,460	(103,717)	1
3	0	26,095	1,557	4,154	20,384	8,456	4,533	7,396	15,851	12,342	(91,375)	2
4	0	26,095	1,557	3,842	20,696	7,822	4,892	7,982	15,804	11,320	(80,055)	3
5	0	26,095	1,557	3,554	20,984	7,235	5,225	8,525	15,759	10,385	(69,670)	4
6		26,095	1,557	3,287	21,251	6,693	5,532	9,026	15,719	9,529	(60,142)	5
7		26,095	1,557	3,041	21,497	6,190	5,817	9,490	15,680	8,745	(51,397)	6
8		26,095	1,557	2,813	21,725	5,727	6,080	9,919	15,646	8,027	(43,370)	7
9		26,095	1,557	2,602	21,936	5,651	6,189	10,097	15,748	7,433	(35,937)	8
10		26,095	1,557	2,394	22,144	5,649	6,268	10,227	15,876	6,894	(29,043)	9
11		26,095	1,557	2,186	22,352	5,651	6,347	10,355	16,006	6,394	(22,650)	10
12		26,095	1,557	1,977	22,561	5,649	6,426	10,485	16,134	5,929	(16,720)	11
13		26,095	1,557	1,769	22,769	5,651	6,505	10,613	16,264	5,498	(11,222)	12
14		26,095	1,557	1,561	22,977	5,649	6,585	10,743	16,392	5,098	(6,124)	13
15		26,095	1,557	1,353	23,185	5,651	6,663	10,871	16,522	4,727	(1,396)	14
16		26,095	1,557	1,145	23,393	5,649	6,743	11,001	16,651	4,383	2,987	15
17		26,095	1,557	937	23,601	5,651	6,821	11,129	16,780	4,063	7,050	16
18		26,095	1,557	728	23,810	5,649	6,901	11,259	16,909	3,767	10,817	17
19		26,095	1,557	520	24,018	5,651	6,979	11,388	17,038	3,492	14,309	18
20		26,095	1,557	312	24,226	5,649	7,059	11,517	17,167	3,237	17,545	19
21		26,095	1,557	104	24,434	2,825	8,211	13,397	16,223	2,814	20,359	20
22		26,095	1,557	(0)	24,538	0	9,324	15,214	15,214	2,428	22,787	21
23		26,095	1,557	0	24,538	0	9,324	15,214	15,214	2,233	25,020	22
24		26,095	1,557	0	24,538	0	9,324	15,214	15,214	2,055	27,075	23
25		26,095	1,557	0	24,538	0	9,324	15,214	15,214	1,890	28,965	24
26		26,095	1,557	0	24,538	0	9,324	15,214	15,214	1,739	30,704	25
27		26,095	1,557	0	24,538	0	9,324	15,214	15,214	1,600	32,303	26
28		26,095	1,557	0	24,538	0	9,324	15,214	15,214	1,472	33,775	27
29		26,095	1,557	0	24,538	0	9,324	15,214	15,214	1,354	35,129	28
30		26,095	1,557	0	24,538	0	9,324	15,214	15,214	1,246	36,375	29
31		26,095	1,557	0	24,538	0	9,324	15,214	15,214	1,146	37,520	30
32		26,095	1,557	0	24,538	0	9,324	15,214	15,214	1,054	38,574	31
33		26,095	1,557	0	24,538	0	9,324	15,214	15,214	970	39,544	32
34		26,095	1,557	0	24,538	0	9,324	15,214	15,214	892	40,436	33
35		26,095	1,557	0	24,538	0	9,324	15,214	15,214	821	41,257	34
36		26,095	1,557	0	24,538	0	9,324	15,214	15,214	755	42,012	35
37		26,095	1,557	0	24,538	0	9,324	15,214	15,214	695	42,707	36
38		26,095	1,557	0	24,538	0	9,324	15,214	15,214	639	43,346	37
39		26,095	1,557	0	24,538	0	9,324	15,214	15,214	588	43,934	38
40		26,095	1,557	0	24,538	0	9,324	15,214	15,214	541	44,474	39
41		26,095	1,557	0	24,538	0	9,324	15,214	15,214	498	44,972	40
42		26,095	1,557	0	24,538	0	9,324	15,214	15,214	458	45,430	41
43		26,095	1,557	0	24,538	0	9,324	15,214	15,214	421	45,851	42
44		26,095	1,557	0	24,538	0	9,324	15,214	15,214	387	46,238	43
45		26,095	1,557	0	24,538	0	9,324	15,214	15,214	356	46,594	44
46		26,095	1,557	0	24,538	0	9,324	15,214	15,214	328	46,922	45
47		26,095	1,557	0	24,538	0	9,324	15,214	15,214	302	47,224	46
48		26,095	1,557	0	24,538	0	9,324	15,214	15,214	277	47,501	47
49		26,095	1,557	0	24,538	0	9,324	15,214	15,214	255	47,757	48
50		26,095	1,557	0	24,538	0	9,324	15,214	15,214	235	47,991	49
51		26,095	1,557	0	24,538	0	9,324	15,214	15,214	216	48,207	50
52		26,095	1,557	0	24,538	0	9,324	15,214	15,214	199	48,406	51
53		26,095	1,557	0	24,538	0	9,324	15,214	15,214	183	48,589	52
54		26,095	1,557	0	24,538	0	9,324	15,214	15,214	168	48,757	53
55		26,095	1,557	0	24,538	0	9,324	15,214	15,214	155	48,912	54
56		26,095	1,557	0	24,538	0	9,324	15,214	(111,423)	(1,043)	47,869	55
Total	126,637	1,454,793	86,862	47,434	1,320,497	126,637	453,667	740,193	613,556	47,869	649,596	56

POST-CONSTRUCTION

Bay State Gas Company
D.T.E. 05-27
Attachment RR-DTE-136(a)
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Bay State Gas Company
Van Sickle School & Fire/Police Complex - Project S99D1064
Project Summary

Capital & O&M Costs

	<u>Actual</u>
Mains	\$ 120,013
Services	6,064
Meters	560
Total	\$ 126,637

Total O&M

Current	\$ 1,227
Expected	\$ 1,557

<u>Load & Net Revenue</u>	<u>Annual Load (Mcf)</u>	<u>Annual Net Revenue</u>
Van Sickle School (2 meters)		
Total current	10,372	\$ 18,203
Total expected	14,234	\$ 23,305
Fire & Police Complex (1 meter)		
Total current	521	\$ 1,365
Total expected	1,368	\$ 2,790
Total		
Total current	10,893	\$ 19,568
Total expected	15,602	\$ 26,095

Rate of Return (ROR) 12.06%

BSG/NU COMPANY MAIN AUTHORIZATION ORDER

Field Loc: **SPRINGFIELD**

PROJECT ID# **S99D1064**

PRE-CONSTRUCTION
IRR

Bay State Gas Company D.T.E. 05-27 Attachment RR-DT-138(a) Page 38 of 63	
Hurdle Rate:	8.75%

Work Code **MNECC**

DESCRIPTION OF PROJECT: **This authorization provides for the estimated cost to install a New 6" IP gas main for 1 new customer**

JOB LIMITS

1.) from: **Nottingham St.** to: **Carew St.**
2.) from: **Merrimac Ave.** to: **End of main at 1170 Carew St.**

*Cust. Paying 60,000.
(43K grossed up for TAXES)*

Services **1** Total Service Cost \$ **4208.7**

Cust Contribution = \$ **43,449.**

COST RECORD	BUDGET	ACTUAL	VARIANCE
Materials	\$14,196		\$14,196
Company Labor	\$408		408
Purchases	\$41,383		41,383
Overheads	\$15,448		15,448
Total	\$71,435	\$0	\$71,435

Today's Date: **08/02/99**
Start Date: _____
Comp. Date: _____
Estimator: **Radwilowicz**
Sales Rep: **Desroiser**
CIS #: **1029033**

	Pipe Added Street Name and Town	Pipe Size	Pipe Type	Footage		W.O. # Install	W.O. # Tie - In
				Estimate	Actual		
1	Merrimac Ave. Springfield	6	PE	2450			
	Carew St. Springfield	6	PE	400			
	0	0	PE	0			
4	0	0	PE	0			
5	0	0	PE	0			
6	0	0	PE	0			

2850

	Pipe Retired Street Name and Town	Inst. Year	Pipe Size	Pipe Type	Footage		W.O. # Replace	W.O. # Tie - In
					Estimate	Actual		
1								
2								
3								
4								
5								
6								

Please Sign and Date

<input type="checkbox"/> Residential <input checked="" type="checkbox"/> C & I	Local Approval (Growth Projects)	Local Approval (Repl, Mun, Sys Imp)
	CC Leader <i>Ed Rad 8-2-99</i>	Engineering
	Sales Leader <i>P. G. 5-18-00</i>	Local Leader

M. 1/1/00

<input checked="" type="checkbox"/> Growth <input type="checkbox"/> Replacement <input type="checkbox"/> Municipal <input type="checkbox"/> Sys Improve	CORPORATE APPROVAL OVER \$25,000	
	Sub Process Leader <i>Ronald J. Morina</i>	
	OVER \$50,000	
	Corporate Engineering	
	Process Leader	
	CFO	

ENV 5817 app 3/14/00 8/1/00 79-15

ATTACHMENT RR-DTE-136 (a)

Revenue Producing Plants Additions
Account 367 (Mains) > \$100K

List No. 8 (on DTE-3-22 Revised)

POST-CONSTRUCTION

Bay State Gas Company
D.T.E. 05-27
Attachment RR-DTE-136(a)
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POST CONSTRUCTION - RATE OF RETURN ESTIMATE

WORKPAPER

Project: Sunnyside, Ranch Road
Southwick

Total Capital and O&M Costs

Capital		
Mains	\$	168,956
Services		5,940
Meters		594
Marginal Capital		0
Total	\$	175,490

Meter Counts, Mcf Load and Net Revenue

Meter Counts	5	at 12/31/04
Load (Mcf)	800	
Net Revenue	\$	2,535 annual

Note: The Sunnyside Ranch residential Project began in 2002 and projected to be a 5 year project. As of June 2005, 9 residential customers have been added. There is approximately 2.5 years remaining of the project plan.

O & M costs \$ 830 annual

Property Tax Rate \$ 14.88 per thousand

Results Summary

	55 Yrs.
* IRR	0.00%
* NPV	(\$148,427)
* Customer Contribution	\$244,243

Year	Investment	Revenue	O&M	Property Tax	Profit Before Taxes	Depreciation 20 Year Class	Income Taxes	Total Net Income	Total Net Cash Flow (\$175,490)	P.V. OF Cash Flow (\$175,490)	Payback Calculation (\$175,490)	Payback Period
1	\$175,490	\$2,535	\$830	\$2,611	(\$906)	\$6,581	(\$2,937)	(\$4,550)	\$2,031	1,870	(\$173,620)	0
2		2,535	830	2,611	(906)	12,669	(3,325)	(8,249)	4,419	3,746	(169,874)	1
3		2,535	830	2,611	(906)	11,717	(4,952)	(7,671)	4,046	3,157	(166,717)	2
4		2,535	830	2,611	(906)	10,840	(4,608)	(7,138)	3,702	2,659	(164,058)	3
5		2,535	830	2,611	(906)	10,026	(4,289)	(6,643)	3,383	2,237	(161,820)	4
6		2,535	830	2,611	(906)	9,275	(3,994)	(6,187)	3,088	1,880	(159,940)	5
7		2,535	830	2,611	(906)	8,578	(3,721)	(5,763)	2,815	1,578	(158,363)	6
8		2,535	830	2,611	(906)	7,936	(3,469)	(5,373)	2,563	1,323	(157,040)	7
9		2,535	830	2,611	(906)	7,830	(3,427)	(5,309)	2,521	1,198	(155,842)	8
10		2,535	830	2,611	(906)	7,829	(3,427)	(5,308)	2,521	1,103	(154,740)	9
11		2,535	830	2,611	(906)	7,830	(3,427)	(5,309)	2,521	1,015	(153,724)	10
12		2,535	830	2,611	(906)	7,829	(3,427)	(5,308)	2,521	935	(152,790)	11
13		2,535	830	2,611	(906)	7,830	(3,427)	(5,309)	2,521	861	(151,929)	12
14		2,535	830	2,611	(906)	7,829	(3,427)	(5,308)	2,521	792	(151,137)	13
15		2,535	830	2,611	(906)	7,830	(3,427)	(5,309)	2,521	729	(150,408)	14
16		2,535	830	2,611	(906)	7,829	(3,427)	(5,308)	2,521	671	(149,736)	15
17		2,535	830	2,611	(906)	7,830	(3,427)	(5,309)	2,521	618	(149,118)	16
18		2,535	830	2,611	(906)	7,829	(3,427)	(5,308)	2,521	569	(148,549)	17
19		2,535	830	2,611	(906)	7,830	(3,427)	(5,309)	2,521	524	(148,025)	18
20		2,535	830	2,611	(906)	7,829	(3,427)	(5,308)	2,521	482	(147,543)	19
21		2,535	830	2,611	(906)	3,915	(1,891)	(2,930)	985	174	(147,369)	20
22		2,535	830	2,611	(906)	0	(355)	(551)	(551)	(89)	(147,458)	21
23		2,535	830	2,611	(906)	0	(355)	(551)	(551)	(82)	(147,541)	22
24		2,535	830	2,611	(906)	0	(355)	(551)	(551)	(76)	(147,616)	23
25		2,535	830	2,611	(906)	0	(355)	(551)	(551)	(70)	(147,686)	24
26		2,535	830	2,611	(906)	0	(355)	(551)	(551)	(64)	(147,750)	25
27		2,535	830	2,611	(906)	0	(355)	(551)	(551)	(59)	(147,809)	26
28		2,535	830	2,611	(906)	0	(355)	(551)	(551)	(54)	(147,864)	27
29		2,535	830	2,611	(906)	0	(355)	(551)	(551)	(50)	(147,914)	28
30		2,535	830	2,611	(906)	0	(355)	(551)	(551)	(46)	(147,960)	29
31		2,535	830	2,611	(906)	0	(355)	(551)	(551)	(42)	(148,002)	30
32		2,535	830	2,611	(906)	0	(355)	(551)	(551)	(39)	(148,041)	31
33		2,535	830	2,611	(906)	0	(355)	(551)	(551)	(36)	(148,077)	32
34		2,535	830	2,611	(906)	0	(355)	(551)	(551)	(33)	(148,110)	33
35		2,535	830	2,611	(906)	0	(355)	(551)	(551)	(30)	(148,141)	34
36		2,535	830	2,611	(906)	0	(355)	(551)	(551)	(28)	(148,169)	35
37		2,535	830	2,611	(906)	0	(355)	(551)	(551)	(26)	(148,195)	36
38		2,535	830	2,611	(906)	0	(355)	(551)	(551)	(24)	(148,218)	37
39		2,535	830	2,611	(906)	0	(355)	(551)	(551)	(22)	(148,240)	38
40		2,535	830	2,611	(906)	0	(355)	(551)	(551)	(20)	(148,260)	39
41		2,535	830	2,611	(906)	0	(355)	(551)	(551)	(19)	(148,279)	40
42		2,535	830	2,611	(906)	0	(355)	(551)	(551)	(17)	(148,296)	41
43		2,535	830	2,611	(906)	0	(355)	(551)	(551)	(16)	(148,312)	42
44		2,535	830	2,611	(906)	0	(355)	(551)	(551)	(14)	(148,326)	43
45		2,535	830	2,611	(906)	0	(355)	(551)	(551)	(13)	(148,340)	44
46		2,535	830	2,611	(906)	0	(355)	(551)	(551)	(12)	(148,352)	45
47		2,535	830	2,611	(906)	0	(355)	(551)	(551)	(11)	(148,363)	46
48		2,535	830	2,611	(906)	0	(355)	(551)	(551)	(10)	(148,374)	47
49		2,535	830	2,611	(906)	0	(355)	(551)	(551)	(10)	(148,383)	48
50		2,535	830	2,611	(906)	0	(355)	(551)	(551)	(9)	(148,392)	49
51		2,535	830	2,611	(906)	0	(355)	(551)	(551)	(8)	(148,400)	50
52		2,535	830	2,611	(906)	0	(355)	(551)	(551)	(7)	(148,408)	51
53		2,535	830	2,611	(906)	0	(355)	(551)	(551)	(7)	(148,414)	52
54		2,535	830	2,611	(906)	0	(355)	(551)	(551)	(6)	(148,421)	53
55		2,535	830	2,611	(906)	0	(355)	(551)	(551)	(6)	(148,427)	54
56		2,535	830	2,611	(906)	0	(355)	(551)	(176,041)	(1,717)	(150,143)	55
Total	175,490	141,960	46,480	146,216	(50,736)	175,490	(88,748)	(137,478)	(312,968)	(150,143)	(8,634,512)	56

**PRE-CONSTRUCTION
IRR**

Bay State Gas Company
D.T.E. 05-27
Attachment RR-DTE-136(a)
Page 41 of 73

From: Dana Kim
Sent: Tuesday, October 19, 1999 4:15 PM
To: Giguere, Paul
Subject: RE: Combined residential and commercial ROR.

INTERNAL RATE OF RETURN ANALYSIS

Development Name: Sunnyside Farm
Location: Golf Course
Town: Southwick, MA

Proposed MCF Usage 10,979

Estimated Cost:

New Main	\$84,759
Service	46,523
Meter & Fit	11,502
Marginal Costs	5,776
Project Total	<u>\$148,560</u>

Results (Cash Flow Basis)

	<u>55 Yrs.</u>	<u>35 Yrs.</u>	<u>15 Yrs.</u>
Rate of return - IRR	10.41%	10.08%	5.45%
Customer Contribution	\$0	\$0	\$38,779
* NPV	\$23,665	\$16,931	(\$23,566)
* Net Payback (years)	23	23	23
* Net Gas Revenues	\$32,924	\$32,924	\$32,924
* Net Rate/MMBtu	\$3.00	\$3.00	\$3.00

Thanks, Kim.

-----Original Message-----

From: Giguere, Paul
Sent: Tuesday, October 19, 1999 11:26 AM
To: Dana, Kim
Subject: Combined residential and commercial ROR.

Hi Kim,

I have a project in Southwick (town code 203) that requires a combined commercial and residential ROR. The project is the Sunnyside Farm. It's a new golf course and 55 lot housing development. I'm figuring the commercial load to come on in year one and the residential load over a five year period. These are the details;

**PRE-CONSTRUCTION
IRR**

Bay State Gas Company
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Year 1
Commercial loads (3 meters)
1 meter @ rate T Ht 600 mcf
 Bs 650 mcf
2 meter @ rate R Ht 125 mcf
 Bs 178 mcf
3 meter @ rate T Ht 600 mcf
 Bs 26 mcf

Residential Loads
8 meters @ rate 1 Ht 1064 mcf
 Bs 216 mcf

Year 1
Main, Service, and meters

Main	\$47,108
Services	\$10,523
Meters	\$ 5,934

Year 2
No Commercial load
Residential load
10 meters @ rate 1 Ht 1330 mcf
 Bs 270 mcf

Year 2

Main	none
Services	\$8,250
Meters	\$1,276

Year 3
No Commercial load
Residential load
12 meters @ rate 1 Ht 1596 mcf
 Bs 324 mcf

Year 3

Main	\$17,949
Services	\$ 9,000
Meters	\$ 1,392

Year 4
No Commercial load
Residential load
14 meters @ rate 1 Ht 1862 mcf
 Bs 378 mcf

Year 4

Main	\$10,102
Services	\$10,500
Meters	\$ 1,624

Year 5
No Commercial load
Residential load
11 meters @ rate 1 Ht 1463 mcf
 Bs 297 mcf

Year 5

Main	\$9,600
Services	\$8,250
Meters	\$1,276

Thanks,
Paul

ATTACHMENT RR-DTE-136 (a)

Revenue Producing Plants Additions
Account 367 (Mains) > \$100K

List No. 9 (on DTE-3-22 Revised)

POST CONSTRUCTION - RATE OF RETURN ESTIMATE

WORKPAPER

Project: King Phillip Estates
Raynham

Total Capital and O&M Costs

Meter Counts, Mef Load and Net Revenue

Capital			Meter Counts	98
Mains	\$	100,551	Load (Mef)	14,014
Services		71,638	Net Revenue	\$ 52,229 annual
Meters		11,598		
Marginal Capital		14,719		
Total	\$	198,506		
O & M costs	\$	15,929 annual		
Property Tax Rate	\$	16.10 per thousand		

Results Summary

	55 Yrs.
* IRR	11.40%
* NPV	\$58,908
* Customer Contribution	\$0

Year	Investment	Revenue	O&M	Property Tax	Profit Before Taxes	Depreciation 20 Year Class	Income Taxes	Total Net Income	Total Net Cash Flow (\$139,062)	P.V. OF Cash Flow (\$139,062)	Payback Calculation (\$139,062)	Payback Period
1	\$139,062	\$19,719	\$6,014	\$2,239	\$11,466	\$5,215	\$2,452	\$3,799	(\$139,062)	(\$139,062)	(\$139,062)	0
2	35,581	39,438	12,628	2,812	24,598	11,370	5,189	8,039	(\$26,567)	(24,459)	(\$163,521)	1
3	23,861	52,229	15,929	3,196	33,104	12,749	7,985	12,370	25,119	19,601	(147,694)	2
4		52,229	15,929	3,196	33,104	12,688	8,009	12,407	25,095	18,028	(129,666)	3
5		52,229	15,929	3,196	33,104	11,736	8,383	12,985	24,721	16,350	(113,316)	4
6		52,229	15,929	3,196	33,104	10,856	8,728	13,520	24,376	14,842	(98,474)	5
7		52,229	15,929	3,196	33,104	10,041	9,048	14,015	24,056	13,485	(84,988)	6
8		52,229	15,929	3,196	33,104	9,289	9,343	14,472	23,761	12,263	(72,725)	7
9		52,229	15,929	3,196	33,104	8,980	9,464	14,660	23,640	11,232	(61,493)	8
10		52,229	15,929	3,196	33,104	8,870	9,507	14,727	23,597	10,322	(51,171)	9
11		52,229	15,929	3,196	33,104	8,857	9,512	14,735	23,592	9,561	(41,671)	10
12		52,229	15,929	3,196	33,104	8,856	9,512	14,736	23,592	8,747	(32,924)	11
13		52,229	15,929	3,196	33,104	8,857	9,512	14,735	23,592	8,053	(24,872)	12
14		52,229	15,929	3,196	33,104	8,856	9,512	14,736	23,592	7,413	(17,458)	13
15		52,229	15,929	3,196	33,104	8,857	9,512	14,735	23,592	6,825	(10,633)	14
16		52,229	15,929	3,196	33,104	8,856	9,512	14,736	23,592	6,283	(4,349)	15
17		52,229	15,929	3,196	33,104	8,857	9,512	14,735	23,592	5,785	1,435	16
18		52,229	15,929	3,196	33,104	8,856	9,512	14,736	23,592	5,326	6,761	17
19		52,229	15,929	3,196	33,104	8,857	9,512	14,735	23,592	4,903	11,664	18
20		52,229	15,929	3,196	33,104	8,856	9,512	14,736	23,592	4,514	16,178	19
21		52,229	15,929	3,196	33,104	5,754	10,729	16,621	22,375	3,941	20,126	20
22		52,229	15,929	3,196	33,104	1,858	12,258	18,988	20,846	3,381	23,500	21
23		52,229	15,929	3,196	33,104	532	12,778	19,794	20,326	3,035	26,535	22
24		52,229	15,929	3,196	33,104	0	12,987	20,117	20,117	2,765	29,301	23
25		52,229	15,929	3,196	33,104	0	12,987	20,117	20,117	2,546	31,846	24
26		52,229	15,929	3,196	33,104	0	12,987	20,117	20,117	2,344	34,190	25
27		52,229	15,929	3,196	33,104	0	12,987	20,117	20,117	2,158	36,348	26
28		52,229	15,929	3,196	33,104	0	12,987	20,117	20,117	1,987	38,334	27
29		52,229	15,929	3,196	33,104	0	12,987	20,117	20,117	1,829	40,163	28
30		52,229	15,929	3,196	33,104	0	12,987	20,117	20,117	1,684	41,847	29
31		52,229	15,929	3,196	33,104	0	12,987	20,117	20,117	1,550	43,397	30
32		52,229	15,929	3,196	33,104	0	12,987	20,117	20,117	1,427	44,824	31
33		52,229	15,929	3,196	33,104	0	12,987	20,117	20,117	1,314	46,138	32
34		52,229	15,929	3,196	33,104	0	12,987	20,117	20,117	1,210	47,348	33
35		52,229	15,929	3,196	33,104	0	12,987	20,117	20,117	1,114	48,461	34
36		52,229	15,929	3,196	33,104	0	12,987	20,117	20,117	1,025	49,487	35
37		52,229	15,929	3,196	33,104	0	12,987	20,117	20,117	944	50,430	36
38		52,229	15,929	3,196	33,104	0	12,987	20,117	20,117	869	51,299	37
39		52,229	15,929	3,196	33,104	0	12,987	20,117	20,117	800	52,099	38
40		52,229	15,929	3,196	33,104	0	12,987	20,117	20,117	737	52,836	39
41		52,229	15,929	3,196	33,104	0	12,987	20,117	20,117	678	53,514	40
42		52,229	15,929	3,196	33,104	0	12,987	20,117	20,117	624	54,138	41
43		52,229	15,929	3,196	33,104	0	12,987	20,117	20,117	575	54,713	42
44		52,229	15,929	3,196	33,104	0	12,987	20,117	20,117	529	55,242	43
45		52,229	15,929	3,196	33,104	0	12,987	20,117	20,117	487	55,729	44
46		52,229	15,929	3,196	33,104	0	12,987	20,117	20,117	448	56,178	45
47		52,229	15,929	3,196	33,104	0	12,987	20,117	20,117	413	56,590	46
48		52,229	15,929	3,196	33,104	0	12,987	20,117	20,117	380	56,970	47
49		52,229	15,929	3,196	33,104	0	12,987	20,117	20,117	350	57,320	48
50		52,229	15,929	3,196	33,104	0	12,987	20,117	20,117	322	57,643	49
51		52,229	15,929	3,196	33,104	0	12,987	20,117	20,117	297	57,939	50
52		52,229	15,929	3,196	33,104	0	12,987	20,117	20,117	273	58,212	51
53		52,229	15,929	3,196	33,104	0	12,987	20,117	20,117	251	58,464	52
54		52,229	15,929	3,196	33,104	0	12,987	20,117	20,117	231	58,695	53
55		52,229	15,929	3,196	33,104	0	12,987	20,117	20,117	213	58,908	54
56		52,229	15,929	3,196	33,104	0	12,987	20,117	(178,387)	(1,739)	57,169	55
Total	198,504	2,879,523	878,208	177,635	1,823,680	198,503	637,557	987,620	789,115	57,169	390,656	56

Date: 18-May-98

Residential ROR Model

RESIDENTIAL RATE OF RETURN ANALYSIS

Development Name: King Phillip Est & Britton St

Address: Raynham

Town: Brockton

Division: 0

Number of Meters: 100

Proposed Heat Load Mcf: 11,350

Proposed Base Load Mcf: 2,918

Total Load: 14,268

Rate Schedule

	N	N
--	---	---

Heat/Summer Load per Meter 114

Base Load per Meter 29

Load Per Meter 143

Estimated Cost:

New Main \$77,648

Service 89,707

Meter & Fit 11,600

Less: System Improvement n/a

Marginal Costs 12,169

Project Total \$191,124

Cost per Meter \$1,911

Results (Cash Flow Basis)

Rate of return - IRR 11.34%

Customer Contribution \$0

* NPV \$40,479

* Net Payback (years) 16

* Customer Contribution Required \$0

* Net Gas Revenues \$53,295

* Net Rate/MMBtu \$3.74

Results (Income Basis)

Net Gas Revenues

O&M

Depreciation

Property Taxes

Operating Income

Interest Expense

Income Taxes

Net Income

	Year 1	Year 2	Year 3	Year 4
Net Gas Revenues	\$19,487	\$39,487	\$53,295	\$53,295
O&M	6,014	12,191	16,264	16,264
Depreciation	2,459	5,741	7,104	7,645
Property Taxes	1,887	2,651	3,089	3,089
Operating Income	9,007	18,904	26,849	26,308
Interest Expense	4,341	5,792	6,747	6,747
Income Taxes	1,831	5,144	7,888	7,674
Net Income	\$2,835	\$7,968	\$12,216	\$11,897

**PRE-CONSTRUCTION
IRR**

Bay State Gas Company
D.T.E. 05-27
Attachment RR-DTE-136(a)
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05/18/98

AUTHORIZATION REQUEST

To: Please sign and forward to the next person on list.

~~M. Poulin~~

~~P. LaShoto~~

~~C. Collins~~

~~T. Sherman~~

From: B. Prosper

Date: June 02, 1998

Attached for your approval is the authorization for **King Philip Estates**, a 26 lot subdivision, and **Britton Street**, a 74 lot subdivision both located in Raynham. These projects abut each other and are to be constructed simultaneously.

Welch Building Corp, the Developer/Builder for this project is planning on a completion date of the year 2000. Welch has been active since 1990 and is located in our service territory.

Prior projects include:

- **Easton Country Estates** in Easton, consisting of 42 single homes and 17 duplexes, took approximately 3 years to complete.
- **Strawberry Fields** in Easton, consists of 26 homes, construction began in 1996 and to date 21 have been completed.
- **Pheasant Hill** in Stoughton, consists of 24 homes. Twenty one have been completed within 3 years.

In addition to the above mentioned projects, Ganawatty Farms in Walpole and Colony Park in Easton are in the preliminary stages, awaiting local building approvals.

The ROR for King Phillip Estates and Britton St. is 11.34%, with a net present value of \$40, 479.

If you have any questions please contact me at Ext. 1416. Thank you for your consideration.

Bevalie Prosper

ATTACHMENT RR-DTE-136 (a)

Revenue Producing Plants Additions
Account 367 (Mains) > \$100K

List No. 10 (on DTE-3-22 Revised)

POST CONSTRUCTION - RATE OF RETURN ESTIMATE

WORKPAPER

Project: Rexham Graphics
South Hadley

Total Capital and O&M Costs

Meter Counts, Mcf Load and Net Revenue

Capital		Meter Counts		1	
Mains	\$ 255,820	Load (Mcf)		210,000	
Services	2,702	Net Revenue	\$	211,700	annual
Meters	506				
Marginal Capital	17,263				
Total	\$ 276,285				

O & M costs \$ 163 annual

Property Tax Rate \$ 17.10 per thousand

Results Summary
35 Yrs.

* IRR	47.64%
* NPV	\$1,153,571
* Customer Contribution	\$0

Year	Investment	Revenue	O&M	Property Tax	Profit Before Taxes	Depreciation 20 Year Class	Income Taxes	Total Net Income	Total Net Cash Flow (\$276,285)	P.V. OF Cash Flow (\$276,285)	Payback Calculation (\$276,285)	Payback Period
1	\$276,285	\$211,700	\$163	\$4,724	\$206,813	\$10,361	\$77,068	\$119,384	\$129,745	119,448	(\$156,837)	1
2		211,700	163	4,724	206,813	19,945	73,308	113,560	133,505	113,156	(43,681)	2
3		211,700	163	4,724	206,813	18,448	73,896	114,470	132,917	103,717	60,637	3
4		211,700	163	4,724	206,813	17,066	74,438	115,309	132,375	95,097	155,134	4
5		211,700	163	4,724	206,813	15,784	74,941	116,088	131,872	87,218	242,352	5
6		211,700	163	4,724	206,813	14,602	75,405	116,807	131,408	80,014	322,365	6
7		211,700	163	4,724	206,813	13,505	75,835	117,473	130,978	73,423	395,788	7
8		211,700	163	4,724	206,813	12,494	76,231	118,088	130,582	67,391	463,179	8
9		211,700	163	4,724	206,813	12,328	76,297	118,189	130,516	62,012	525,191	9
10		211,700	163	4,724	206,813	12,325	76,298	118,190	130,515	57,090	582,282	10
11		211,700	163	4,724	206,813	12,328	76,297	118,189	130,516	52,560	634,842	11
12		211,700	163	4,724	206,813	12,325	76,298	118,190	130,515	48,389	683,231	12
13		211,700	163	4,724	206,813	12,328	76,297	118,189	130,516	44,549	727,780	13
14		211,700	163	4,724	206,813	12,325	76,298	118,190	130,515	41,013	768,793	14
15		211,700	163	4,724	206,813	12,328	76,297	118,189	130,516	37,759	806,552	15
16		211,700	163	4,724	206,813	12,325	76,298	118,190	130,515	34,762	841,314	16
17		211,700	163	4,724	206,813	12,328	76,297	118,189	130,516	32,004	873,318	17
18		211,700	163	4,724	206,813	12,325	76,298	118,190	130,515	29,464	902,781	18
19		211,700	163	4,724	206,813	12,328	76,297	118,189	130,516	27,126	929,907	19
20		211,700	163	4,724	206,813	12,325	76,298	118,190	130,515	24,973	954,879	20
21		211,700	163	4,724	206,813	6,164	78,715	121,934	128,998	22,565	977,445	21
22		211,700	163	4,724	206,813	0	81,133	125,680	125,680	20,382	997,827	22
23		211,700	163	4,724	206,813	0	81,133	125,680	125,680	18,765	1,016,592	23
24		211,700	163	4,724	206,813	0	81,133	125,680	125,680	17,276	1,033,867	24
25		211,700	163	4,724	206,813	0	81,133	125,680	125,680	15,905	1,049,772	25
26		211,700	163	4,724	206,813	0	81,133	125,680	125,680	14,642	1,064,414	26
27		211,700	163	4,724	206,813	0	81,133	125,680	125,680	13,480	1,077,894	27
28		211,700	163	4,724	206,813	0	81,133	125,680	125,680	12,411	1,090,305	28
29		211,700	163	4,724	206,813	0	81,133	125,680	125,680	11,426	1,101,731	29
30		211,700	163	4,724	206,813	0	81,133	125,680	125,680	10,519	1,112,250	30
31		211,700	163	4,724	206,813	0	81,133	125,680	125,680	9,684	1,121,934	31
32		211,700	163	4,724	206,813	0	81,133	125,680	125,680	8,916	1,130,850	32
33		211,700	163	4,724	206,813	0	81,133	125,680	125,680	8,208	1,139,058	33
34		211,700	163	4,724	206,813	0	81,133	125,680	125,680	7,557	1,146,614	34
35		211,700	163	4,724	206,813	0	81,133	125,680	125,680	6,957	1,153,571	35
36		211,700	163	4,724	206,813	0	81,133	125,680	125,680	6,405	1,159,976	36
37		211,700	163	4,724	206,813	0	81,133	125,680	125,680	5,897	1,165,873	37
38		211,700	163	4,724	206,813	0	81,133	125,680	125,680	5,429	1,171,302	38
39		211,700	163	4,724	206,813	0	81,133	125,680	125,680	4,998	1,176,360	39
40		211,700	163	4,724	206,813	0	81,133	125,680	125,680	4,601	1,180,901	40
41		211,700	163	4,724	206,813	0	81,133	125,680	125,680	4,236	1,185,137	41
42		211,700	163	4,724	206,813	0	81,133	125,680	125,680	3,900	1,189,037	42
43		211,700	163	4,724	206,813	0	81,133	125,680	125,680	3,590	1,192,627	43
44		211,700	163	4,724	206,813	0	81,133	125,680	125,680	3,305	1,195,933	44
45		211,700	163	4,724	206,813	0	81,133	125,680	125,680	3,043	1,198,976	45
46		211,700	163	4,724	206,813	0	81,133	125,680	125,680	2,802	1,201,778	46
47		211,700	163	4,724	206,813	0	81,133	125,680	125,680	2,579	1,204,357	47
48		211,700	163	4,724	206,813	0	81,133	125,680	125,680	2,375	1,206,732	48
49		211,700	163	4,724	206,813	0	81,133	125,680	125,680	2,186	1,208,918	49
50		211,700	163	4,724	206,813	0	81,133	125,680	125,680	2,013	1,210,930	50
51		211,700	163	4,724	206,813	0	81,133	125,680	125,680	1,853	1,212,783	51
52		211,700	163	4,724	206,813	0	81,133	125,680	125,680	1,706	1,214,489	52
53		211,700	163	4,724	206,813	0	81,133	125,680	125,680	1,571	1,216,060	53
54		211,700	163	4,724	206,813	0	81,133	125,680	125,680	1,446	1,217,506	54
55		211,700	163	4,724	206,813	0	81,133	125,680	125,680	1,331	1,218,837	55
56		211,700	163	4,724	206,813	0	81,133	125,680	125,680	(1,469)	1,217,368	56
Total	276,285	11,855,200	9,128	264,544	11,581,528	276,285	4,435,047	6,870,196	6,593,911	1,217,368	51,752,864	

5/26/98

Rexam Graphics - Incremental Load Capital Support (210,760 mcf)

INPUT ==>

Customers Count	Capital	Marginal Capital	Total Capital	Net Revenue	Customer Rebates	O & M Expense	Property Tax	Discount Rate
Yr 1	1	\$359,370	\$24,437	\$383,807	211,700	0	\$17.15	8.75%
Yr 2	0	0	0	0	0	0		
Yr 3	0	0	0	0	0	0		
Yr 4	0	0	0	0	0	0		
Yr 5	0	0	0	0	0	0		
Total	1	359,370	24,437	383,807	211,700			

Effective Tax Rate

39.225%

OUTPUT==>

IRR NPV	3 Years	5 Years	10 Years	15 Years	20 Years	25 Years	50 Years
	2.15% (\$44,647)	21.76% \$138,739	32.58% \$478,040	34.21% \$700,351	34.53% \$846,506	\$938,258	34.62% \$1,091,747

DCF Analysis

Year	Net Revenue	O & M Expense	Customer Rebates	Prop. Tax	Profit B Tax	Deprc Sch.	Deprc Amount	Income Tax	Net Cash Flow	PV Cash Flow	Pay Back	Year
1	\$211,700	\$0	\$0	\$6,582	\$205,118	0.0375	\$14,393	\$74,812	\$130,306	(\$383,807)	(\$263,986)	1
2	211,700	0	0	6,582	205,118	0.0722	27,707	69,589	135,528	\$119,821	(149,389)	2
3	211,700	0	0	6,582	205,118	0.0668	25,627	70,405	134,712	114,597	(44,647)	3
4	211,700	0	0	6,582	205,118	0.0618	23,708	71,158	133,960	104,742	51,129	4
5	211,700	0	0	6,582	205,118	0.0571	21,927	71,857	133,261	95,776	138,739	5
6	211,700	0	0	6,582	205,118	0.0529	20,284	72,501	132,617	87,611	218,911	6
7	211,700	0	0	6,582	205,118	0.0489	18,760	73,099	132,019	80,172	292,301	7
8	211,700	0	0	6,582	205,118	0.0452	17,356	73,650	131,468	73,389	359,503	8
9	211,700	0	0	6,582	205,118	0.0446	17,125	73,740	131,378	67,203	421,256	9
10	211,700	0	0	6,582	205,118	0.0446	17,122	73,741	131,376	61,753	478,040	10

PRE-CONSTRUCTION
IRR

**PRE-CONSTRUCTION
IRR**

To: Please sign and forward to next person on list:

~~M. Poulin~~ ✓

~~D. Cote~~ *D. Cote*

~~P. LaShoto~~

~~C. Collins~~

~~T. Sherman~~

P. Giguere ✓

From: Paul Giguere

Date: June 11, 1997

Subject: AUTHORIZATION REQUEST - REXAM GRAPHICS

Attached for your approval is the authorization and rate of return for a main extension to Rexam Graphics, located in South Hadley, Ma.

The proposed main extension of 6,600 feet of 8" coated steel is to provide firm gas service to their steam plant. The cost of the main extension is \$359,370, and the rate of return is 34.2%. The 210,000 mcf of new load to support this project is presently being supplied by #6 oil, and interruptible gas service. Because of the added pollution, local stack watchers, and a need to eliminate their oil tanks, Rexam has sent Bay State a letter of intent to remove their oil tanks and convert their steam plant to 100% firm gas service by 1/1/99.

Rexam Graphics is a worldwide leader in the manufacturing of coated paper, films and specialty substrates for imaging technologies. They are currently the largest firm gas customer in the Springfield service territory. Rexam Graphics is a wholly owned subsidiary of Rexam Inc., the U.S. division of Rexam PLC. Rexam PLC is a \$3.5-billion, U.K. based company specializing in packaging, printing and coated products.

ATTACHMENT RR-DTE-136 (a)

Revenue Producing Plants Additions
Account 367 (Mains) > \$100K

List No. // (on DTE-3-22 Revised)

POST-CONSTRUCTION

Bay State Gas Company
D.T.E. 05-27
Attachment RR-DTE-136(a)
Page 52 of 73

POST CONSTRUCTION - RATE OF RETURN ESTIMATE

WORKPAPER

Project: Genetics
North Andover

Total Capital and O&M Costs

Capital		
Mains	\$	409,924
Services		16,542
Meters		0
Incremental Capital		0
Total	\$	426,466

Meter Counts, Mcf Load and Net Revenue

Meter Counts	1
Load (Mcf)	343,000
Net Revenue	\$ 36,024 monthly

O & M costs \$ 285 monthly

Property Tax Rate \$ 22.57 per thousand

Results Summary		
24 Months		
* IRR	34.41%	
* NPV	\$179,236	
* Customer Contribution	\$0	

MONTHLY BASIS

Year	Investment	Revenue	O&M	Property Tax	Profit Before Taxes	Depreciation 20 Year Class	Income Taxes	Total Net Income	Total Net Cash Flow (\$426,466)	P.V. OF Cash Flow (\$426,466)	Payback Calculation (\$426,466)	Payback Period
1	\$ 426,466	\$36,024	\$285	\$800	\$34,939	\$1,327	\$13,186	\$20,426	\$21,753	21,740	(\$404,726)	0
2		36,024	285	800	34,939	1,327	13,186	20,426	21,753	21,727	(382,999)	2
3		36,024	285	800	34,939	1,327	13,186	20,426	21,753	21,714	(361,286)	3
4		36,024	285	800	34,939	1,327	13,186	20,426	21,753	21,700	(339,586)	4
5		36,024	285	800	34,939	1,327	13,186	20,426	21,753	21,687	(317,898)	5
6		36,024	285	800	34,939	1,327	13,186	20,426	21,753	21,674	(296,224)	6
7		36,024	285	800	34,939	1,327	13,186	20,426	21,753	21,661	(274,563)	7
8		36,024	285	800	34,939	1,327	13,186	20,426	21,753	21,648	(252,915)	8
9		36,024	285	800	34,939	1,327	13,186	20,426	21,753	21,635	(231,280)	9
10		36,024	285	800	34,939	1,327	13,186	20,426	21,753	21,622	(209,659)	10
11		36,024	285	800	34,939	1,327	13,186	20,426	21,753	21,609	(188,050)	11
12		36,024	285	800	34,939	1,327	13,186	20,426	21,753	21,596	(166,455)	12
13		47,373	285	800	46,288	2,556	17,156	26,576	29,132	28,904	(137,551)	13
14		47,373	285	800	46,288	2,556	17,156	26,576	29,132	28,886	(108,665)	14
15		47,373	285	800	46,288	2,556	17,156	26,576	29,132	28,869	(79,796)	15
16		47,373	285	800	46,288	2,556	17,156	26,576	29,132	28,851	(50,945)	16
17		47,373	285	800	46,288	2,556	17,156	26,576	29,132	28,834	(22,112)	17
18		47,373	285	800	46,288	2,556	17,156	26,576	29,132	28,816	6,705	18
19		47,373	285	800	46,288	2,556	17,156	26,576	29,132	28,799	35,501	19
20		47,373	285	800	46,288	2,556	17,156	26,576	29,132	28,781	64,285	20
21		47,373	285	800	46,288	2,556	17,156	26,576	29,132	28,764	93,049	21
22		47,373	285	800	46,288	2,556	17,156	26,576	29,132	28,746	121,795	22
23		47,373	285	800	46,288	2,556	17,156	26,576	29,132	28,729	150,524	23
24		47,373	285	800	46,288	2,556	17,156	26,576	29,132	28,712	179,236	24
25		47,373	285	800	46,288	2,365	17,231	26,692	29,057	28,621	207,856	25
26		47,373	285	800	46,288	2,365	17,231	26,692	29,057	28,603	236,460	26
27		47,373	285	800	46,288	2,365	17,231	26,692	29,057	28,586	265,045	27
28		47,373	285	800	46,288	2,365	17,231	26,692	29,057	28,569	293,614	28
29		47,373	285	800	46,288	2,365	17,231	26,692	29,057	28,551	322,165	29
30		47,373	285	800	46,288	2,365	17,231	26,692	29,057	28,534	350,699	30
31		47,373	285	800	46,288	2,365	17,231	26,692	29,057	28,517	379,216	31
32		47,373	285	800	46,288	2,365	17,231	26,692	29,057	28,499	407,715	32
33		47,373	285	800	46,288	2,365	17,231	26,692	29,057	28,482	436,198	33
34		47,373	285	800	46,288	2,365	17,231	26,692	29,057	28,465	464,663	34
35		47,373	285	800	46,288	2,365	17,231	26,692	29,057	28,448	493,110	35
36		47,373	285	800	46,288	0	18,159	28,129	28,129	27,523	520,633	36
37		47,373	285	800	46,288	0	18,159	28,129	28,129	27,506	548,139	37
38		47,373	285	800	46,288	0	18,159	28,129	28,129	27,489	575,629	38
39		47,373	285	800	46,288	0	18,159	28,129	28,129	27,473	603,102	39
40		47,373	285	800	46,288	0	18,159	28,129	28,129	27,456	630,558	40
41		47,373	285	800	46,288	0	18,159	28,129	28,129	27,440	657,997	41
42		47,373	285	800	46,288	0	18,159	28,129	28,129	27,423	685,420	42
43		47,373	285	800	46,288	0	18,159	28,129	28,129	27,406	712,827	43
44		47,373	285	800	46,288	0	18,159	28,129	28,129	27,390	740,216	44
45		47,373	285	800	46,288	0	18,159	28,129	28,129	27,373	767,590	45
46		47,373	285	800	46,288	0	18,159	28,129	28,129	27,357	794,946	46
47		47,373	285	800	46,288	0	18,159	28,129	28,129	27,340	822,286	47
48		47,373	285	800	46,288	0	18,159	28,129	28,129	27,324	849,610	48
49		47,373	285	800	46,288	0	18,159	28,129	28,129	27,307	876,917	49
50		47,373	285	800	46,288	0	18,159	28,129	28,129	27,290	904,207	50
51		47,373	285	800	46,288	0	18,159	28,129	28,129	27,274	931,481	51
52		47,373	285	800	46,288	0	18,159	28,129	28,129	27,257	958,739	52
53		47,373	285	800	46,288	0	18,159	28,129	28,129	27,241	985,980	53
54		47,373	285	800	46,288	0	18,159	28,129	28,129	27,224	1,013,204	54
55		47,373	285	800	46,288	0	18,159	28,129	28,129	27,208	1,040,412	55
56		47,373	285	800	46,288	0	18,159	28,129	(398,337)	(385,058)	655,354	56
Total	426,466	2,516,700	15,960	44,800	2,455,940	72,611	934,980	1,448,349	668,028	665,354	16,531,908	

PRE-CONSTRUCTION
IRR

Project	Genetics Andover, MA	Results:	12 Months	18 Months	24 Months	Income Taxes	Total Net Cash Flow (302,992)	PV of Cash Flow (302,992)	Payback
Capital	302,992	IRR	-26.74%	45.15%	72.03%	13,425	21,744	21,731	(302,992)
Revenues	36,024	NPV	(\$43,092)	\$128,188	\$300,844	13,425	21,744	21,717	(281,261)
O&M	285	Customer Contribution	570	570	570	13,425	21,744	21,704	(239,544)
Property tax	22.57	Payback-Mont	570	570	570	13,425	21,744	21,691	(237,840)
Discount rate	8.750%		570	570	570	13,425	21,744	21,678	(216,146)
Income tax rate	39.230%		570	570	570	13,425	21,744	21,655	(194,470)
CIAC	0.808		570	570	570	13,425	21,744	21,652	(172,806)
			570	570	570	13,425	21,744	21,652	(151,164)
			570	570	570	13,425	21,744	21,638	(128,515)
			570	570	570	13,425	21,744	21,626	(107,890)
			570	570	570	13,425	21,744	21,612	(86,277)
			570	570	570	13,425	21,744	21,599	(64,678)
			570	570	570	13,425	21,744	21,588	(43,092)
			570	570	570	13,425	21,744	21,575	(21,435)
			570	570	570	13,425	21,744	21,562	(14,404)
			570	570	570	13,425	21,744	21,549	43,127
			570	570	570	13,425	21,744	21,536	71,831
			570	570	570	13,425	21,744	21,523	100,518
			570	570	570	13,425	21,744	21,510	129,188
			570	570	570	13,425	21,744	21,497	157,841
			570	570	570	13,425	21,744	21,484	186,476
			570	570	570	13,425	21,744	21,471	215,094
			570	570	570	13,425	21,744	21,458	243,695
			570	570	570	13,425	21,744	21,445	272,278
			570	570	570	13,425	21,744	21,432	300,844
			570	570	570	13,425	21,744	21,419	329,340
			570	570	570	13,425	21,744	21,406	357,818
			570	570	570	13,425	21,744	21,393	386,280
			570	570	570	13,425	21,744	21,380	414,724
			570	570	570	13,425	21,744	21,367	443,151
			570	570	570	13,425	21,744	21,354	471,550
			570	570	570	13,425	21,744	21,341	499,953
			570	570	570	13,425	21,744	21,328	528,328
			570	570	570	13,425	21,744	21,315	556,686
			570	570	570	13,425	21,744	21,302	585,027
			570	570	570	13,425	21,744	21,289	613,351
			570	570	570	13,425	21,744	21,276	641,657

Authorization Request

PRE-CONSTRUCTION
IRR

To: *M. Poulin, ✓*
~~*P. Lashoto,*~~
~~*C. Collins,*~~
T. Sherman
From: *Patricia Dyer*
Date: *August 14, 1998*
Subject: *Genetics Institute, Andover MA Authorization*

Attached is the authorization to provide additional transportation service to Genetics Institute in Andover, MA for their cogeneration project.

Genetics has agreed to sign a 18 month contract at tariff rates, while we negotiate a 10 year contract at a special rate.

To operate their natural gas turbines that are to be installed this Fall, Genetics will need to be provided with 100 mcf/hr. at a minimum of 25psi. In order for Bay State to provide this level of service, \$286,450 of construction must be completed this year. The added mcf from new equipment is 343,000. The rate of return, which includes the construction costs and revenues for the first 18 months only, is 46.15%.

Please sign the authorization and forward along to the next recipient. If you have any questions, I can be reached at extension #5377.

ATTACHMENT RR-DTE-136 (a)

Revenue Producing Plants Additions
Account 367 (Mains) > \$100K

List No. 12 (on DTE-3-22 Revised)

POST CONSTRUCTION - RATE OF RETURN ESTIMATE

WORKPAPER

Project: Wrentham Outlet Mall
Wrentham

Total Capital and O&M Costs

Meter Counts, Mef Load and Net Revenue

Capital			Meter Counts	150
Mains	\$	144,363	Load (Mef)	25,662
Services		120,300		
Meters		14,907		
Marginal Capital		0	Net Revenue	\$ 93,431 annual
Total	\$	279,570		
O & M costs	\$	25,046 annual		
Property Tax Rate	\$	15.19 per thousand		

Results Summary

35 Yrs.

* IRR	15.83%
* NPV	\$200,748
* Customer Contribution	\$0

Year	Investment	Revenue	O&M	Property Tax	Profit Before Taxes	Depreciation 20 Year Class	Income Taxes	Total Net Income	Total Net Cash Flow (\$279,570)	P V OF Cash Flow (\$279,570)	Payback Calculation (\$279,570)	Payback Period
1	\$279,570	\$93,431	\$25,046	\$4,247	\$64,138	\$10,484	\$21,049	\$32,606	\$43,089	39,670	(164,025)	0
2		93,431	25,046	4,247	64,138	20,182	17,244	26,712	46,894	39,746	(200,154)	1
3		93,431	25,046	4,247	64,138	18,667	17,838	27,633	46,300	36,128	(164,025)	2
4		93,431	25,046	4,247	64,138	17,269	18,387	28,482	45,751	32,867	(131,158)	3
5		93,431	25,046	4,247	64,138	15,972	18,896	29,271	45,242	29,922	(101,235)	4
6		93,431	25,046	4,247	64,138	14,775	19,365	29,998	44,773	27,262	(73,973)	5
7		93,431	25,046	4,247	64,138	13,665	19,800	30,672	44,338	24,854	(49,119)	6
8		93,431	25,046	4,247	64,138	12,642	20,202	31,294	43,936	22,675	(26,444)	7
9		93,431	25,046	4,247	64,138	12,474	20,268	31,396	43,870	20,844	(5,600)	8
10		93,431	25,046	4,247	64,138	12,472	20,269	31,398	43,869	19,189	13,589	9
11		93,431	25,046	4,247	64,138	12,474	20,268	31,396	43,870	17,667	31,256	10
12		93,431	25,046	4,247	64,138	12,472	20,269	31,398	43,869	16,265	47,521	11
13		93,431	25,046	4,247	64,138	12,474	20,268	31,396	43,870	14,974	62,495	12
14		93,431	25,046	4,247	64,138	12,472	20,269	31,398	43,869	13,786	76,281	13
15		93,431	25,046	4,247	64,138	12,474	20,268	31,396	43,870	12,692	88,973	14
16		93,431	25,046	4,247	64,138	12,472	20,269	31,398	43,869	11,684	100,657	15
17		93,431	25,046	4,247	64,138	12,474	20,268	31,396	43,870	10,757	111,414	16
18		93,431	25,046	4,247	64,138	12,472	20,269	31,398	43,869	9,903	121,318	17
19		93,431	25,046	4,247	64,138	12,474	20,268	31,396	43,870	9,118	130,435	18
20		93,431	25,046	4,247	64,138	12,472	20,269	31,398	43,869	8,394	138,829	19
21		93,431	25,046	4,247	64,138	6,237	22,714	35,186	41,424	7,297	146,126	20
22		93,431	25,046	4,247	64,138	0	25,161	38,977	38,977	6,321	152,447	21
23		93,431	25,046	4,247	64,138	0	25,161	38,977	38,977	5,819	158,267	22
24		93,431	25,046	4,247	64,138	0	25,161	38,977	38,977	5,358	163,624	23
25		93,431	25,046	4,247	64,138	0	25,161	38,977	38,977	4,932	168,557	24
26		93,431	25,046	4,247	64,138	0	25,161	38,977	38,977	4,541	173,098	25
27		93,431	25,046	4,247	64,138	0	25,161	38,977	38,977	4,181	177,278	26
28		93,431	25,046	4,247	64,138	0	25,161	38,977	38,977	3,849	181,127	27
29		93,431	25,046	4,247	64,138	0	25,161	38,977	38,977	3,543	184,670	28
30		93,431	25,046	4,247	64,138	0	25,161	38,977	38,977	3,262	187,933	29
31		93,431	25,046	4,247	64,138	0	25,161	38,977	38,977	3,003	190,936	30
32		93,431	25,046	4,247	64,138	0	25,161	38,977	38,977	2,765	193,701	31
33		93,431	25,046	4,247	64,138	0	25,161	38,977	38,977	2,546	196,246	32
34		93,431	25,046	4,247	64,138	0	25,161	38,977	38,977	2,344	198,590	33
35		93,431	25,046	4,247	64,138	0	25,161	38,977	38,977	2,158	200,748	34
36		93,431	25,046	4,247	64,138	0	25,161	38,977	38,977	1,986	202,734	35
37		93,431	25,046	4,247	64,138	0	25,161	38,977	38,977	1,829	204,563	36
38		93,431	25,046	4,247	64,138	0	25,161	38,977	38,977	1,684	206,246	37
39		93,431	25,046	4,247	64,138	0	25,161	38,977	38,977	1,550	207,796	38
40		93,431	25,046	4,247	64,138	0	25,161	38,977	38,977	1,427	209,223	39
41		93,431	25,046	4,247	64,138	0	25,161	38,977	38,977	1,314	210,537	40
42		93,431	25,046	4,247	64,138	0	25,161	38,977	38,977	1,209	211,746	41
43		93,431	25,046	4,247	64,138	0	25,161	38,977	38,977	1,113	212,860	42
44		93,431	25,046	4,247	64,138	0	25,161	38,977	38,977	1,025	213,885	43
45		93,431	25,046	4,247	64,138	0	25,161	38,977	38,977	944	214,829	44
46		93,431	25,046	4,247	64,138	0	25,161	38,977	38,977	869	215,698	45
47		93,431	25,046	4,247	64,138	0	25,161	38,977	38,977	800	216,497	46
48		93,431	25,046	4,247	64,138	0	25,161	38,977	38,977	736	217,234	47
49		93,431	25,046	4,247	64,138	0	25,161	38,977	38,977	678	217,912	48
50		93,431	25,046	4,247	64,138	0	25,161	38,977	38,977	624	218,536	49
51		93,431	25,046	4,247	64,138	0	25,161	38,977	38,977	575	219,111	50
52		93,431	25,046	4,247	64,138	0	25,161	38,977	38,977	529	219,640	51
53		93,431	25,046	4,247	64,138	0	25,161	38,977	38,977	487	220,127	52
54		93,431	25,046	4,247	64,138	0	25,161	38,977	38,977	448	220,575	53
55		93,431	25,046	4,247	64,138	0	25,161	38,977	38,977	413	220,988	54
56		93,431	25,046	4,247	64,138	0	25,161	38,977	(240,593)	(2,346)	218,642	55
Total	279,570	5,232,136	1,402,576	237,832	3,591,728	279,570	1,299,360	2,012,798	1,733,228	218,642	6,824,315	56

JUN-03-97 TUE 12:13
JUN-03-97 TUE 10:56

NORTHERN UTILITIES
BSG SALES DEPT

FAX NO. 6034369473
FAX NO. 5084215741

P. 04/04
Bay State Gas Company
D.T.E. 05-27
Attachment RR-DTE 136(a)
Page 5 of 73

Author: Kim Dana at CCCORP
Date: 5/29/97 2:41 PM
Priority: Normal
Receipt Requested
TO: Julie Gage at CCCRO
Subject: Re(3): RUN ROR FOR WRENTHAM VILLAGE PREMIUM OUTLETS

PRE-CONSTRUCTION IRR

----- Message Contents -----

Date: 29-May-97
Commercial ROR Model
C&I RATE OF RETURN ANALYSIS

Development Name: WRENTHAM VILLAGE OUTLETS

Address SOUTH STREET
Town WRENTHAM
Division: Brockton
Number of Meters 166

Proposed Heat Load Mcf: 23,602
Proposed Base Load Mcf: 4,800
Total Load 28,402

Rate Schedule R
S

Heat/Summer Load per Meter 142
Base Load per Meter 29
Load Per Meter 171
Estimated Cost:
New Main \$173,478
Service 49,518
Meter & Fit 0
System Improvement 0
Marginal Costs 15,164
Project Total \$238,160
Cost per Meter \$1,435

Results (Cash Flow Basis)

Rate of return - IRR 15.27%
*Customer Contribution \$0
* NPV \$101,950
* Net Payback (years) 9
* Net Gas Revenue \$53,064
* Net Rate/MMBtu \$70.81

2840

JUN-03-97 TUE 12:11
JUN-03-97 TUE 10:54

NORTHERN UTILITIES
BSG SALES DEPT

FAX NO. 6034369473
FAX NO. 5084275741

P.02/04

Bay State Gas Company
D.T.E. 05-27
Attachment RR-DTE-136(a)
Page 58 of 73

PRE-CONSTRUCTION
IRR



To: Please sign and forward to the next person on list.

M. Poulin *MP*

C. Collins

T. Sherman

From: J. Henriques

Date: June 2, 1997

Subject: Wrentham Village Premium Outlets

Attached for your approval is the authorization for Wrentham Village Premium Outlets. This project is located at the southwest quadrant of the I-495/Route I-A (South Street) interchange in Wrentham, MA. It is a shopping plaza consisting of eight buildings totaling approximately 600,000 square feet of retail space.

Construction will be undertaken in two phases, the first (300,000+/- s.f.) will be completed and ready for occupancy by mid-September 1997. More than 95 percent of this space is rented, with the anchor store, Saks 5th Avenue, leasing over 21,000 square feet. The second and final phase is projected for completion by December 1998. The mall will also house two food courts.

Owner of the outlet center is Chelsea GCA Realty Limited Partnership of Roseland, New Jersey. The company is 67.5% owned by its sole general partner, Chelsea GCA Realty, Inc. which has full and complete control over the management of the partnership. Chelsea is a real estate investment company with 16 outlet centers in seven states, including 10 in California. According to Dun and Bradstreet, the company employs 300, owns properties valued at more than \$374 million, has a worth of \$261 million and has an overall "good" credit rating.

A main extension of 3030 feet is needed to reach the project, and 5600 additional feet are required within the project. We plan to install 25 services and 166 meters based upon Chelsea's leasing plan. Total ROR cost is \$236,444 for the added load of 28,402 mcf. The rate of return is 15.27%.

If you have any questions please call me at 1205. Thanks.

ATTACHMENT RR-DTE-136 (a)

Revenue Producing Plants Additions
Account 367 (Mains) > \$100K

List No. 13 (on DTE-3-22 Revised)

POST CONSTRUCTION - RATE OF RETURN ESTIMATE WORKPAPER

Project: Southwick Expansion - So. Longyard Road
Southwick

Total Capital and O&M Costs			Meter Counts, Mcf Load and Net Revenue		
Capital			Meter Counts		56
Mains	\$	133,345	Load (Mcf)		10,024
Services		65,072			
Meters		2,856			
Marginal Capital		5,528	Net Revenue	\$	30,312 annual
Total	\$	206,801			
O & M costs	\$	9,382 annual			
Property Tax Rate	\$	14.88 per thousand			

Results Summary		
	55 Yrs.	
* IRR	6.53%	
* NPV	(\$42,933)	
* Customer Contribution	\$70,649	

Year	Investment	Revenue	O&M	Property Tax	Profit Before Taxes	Depreciation 20 Year Class	Income Taxes	Total Net Income	Total Net Cash Flow (\$206,801)	P.V. OF Cash Flow (\$206,801)	Payback Calculation (\$206,801)	Payback Period
1	\$206,801	\$30,312	\$9,382	\$3,077	\$17,853	\$7,755	\$3,961	\$6,137	\$13,892	12,789	(\$194,012)	1
2		30,312	9,382	3,077	17,853	14,929	1,147	1,777	16,706	14,160	(179,852)	2
3		30,312	9,382	3,077	17,853	13,808	1,587	2,458	16,266	12,693	(167,160)	3
4		30,312	9,382	3,077	17,853	12,774	1,992	3,086	15,861	11,394	(155,765)	4
5		30,312	9,382	3,077	17,853	11,815	2,369	3,670	15,484	10,241	(145,525)	5
6		30,312	9,382	3,077	17,853	10,929	2,716	4,207	15,117	9,217	(136,308)	6
7		30,312	9,382	3,077	17,853	10,108	2,938	4,706	14,815	8,305	(128,003)	7
8		30,312	9,382	3,077	17,853	9,352	3,335	5,166	14,518	7,492	(120,511)	8
9		30,312	9,382	3,077	17,853	9,227	3,384	5,242	14,469	6,875	(113,636)	9
10		30,312	9,382	3,077	17,853	9,225	3,385	5,243	14,468	6,329	(107,307)	10
11		30,312	9,382	3,077	17,853	9,227	3,384	5,242	14,469	5,827	(101,480)	11
12		30,312	9,382	3,077	17,853	9,225	3,385	5,243	14,468	5,364	(96,116)	12
13		30,312	9,382	3,077	17,853	9,227	3,384	5,242	14,469	4,939	(91,177)	13
14		30,312	9,382	3,077	17,853	9,225	3,385	5,243	14,468	4,547	(86,631)	14
15		30,312	9,382	3,077	17,853	9,227	3,384	5,242	14,469	4,186	(82,445)	15
16		30,312	9,382	3,077	17,853	9,225	3,385	5,243	14,468	3,854	(78,591)	16
17		30,312	9,382	3,077	17,853	9,227	3,384	5,242	14,469	3,548	(75,043)	17
18		30,312	9,382	3,077	17,853	9,225	3,385	5,243	14,468	3,266	(71,777)	18
19		30,312	9,382	3,077	17,853	9,227	3,384	5,242	14,469	3,007	(68,770)	19
20		30,312	9,382	3,077	17,853	9,225	3,385	5,243	14,468	2,768	(66,001)	20
21		30,312	9,382	3,077	17,853	4,614	5,194	8,046	12,659	2,230	(63,771)	21
22		30,312	9,382	3,077	17,853	0	7,004	10,849	10,849	1,759	(62,012)	22
23		30,312	9,382	3,077	17,853	0	7,004	10,849	10,849	1,620	(60,392)	23
24		30,312	9,382	3,077	17,853	0	7,004	10,849	10,849	1,491	(58,901)	24
25		30,312	9,382	3,077	17,853	0	7,004	10,849	10,849	1,373	(57,528)	25
26		30,312	9,382	3,077	17,853	0	7,004	10,849	10,849	1,264	(56,264)	26
27		30,312	9,382	3,077	17,853	0	7,004	10,849	10,849	1,164	(55,100)	27
28		30,312	9,382	3,077	17,853	0	7,004	10,849	10,849	1,071	(54,029)	28
29		30,312	9,382	3,077	17,853	0	7,004	10,849	10,849	986	(53,042)	29
30		30,312	9,382	3,077	17,853	0	7,004	10,849	10,849	908	(52,134)	30
31		30,312	9,382	3,077	17,853	0	7,004	10,849	10,849	836	(51,298)	31
32		30,312	9,382	3,077	17,853	0	7,004	10,849	10,849	770	(50,529)	32
33		30,312	9,382	3,077	17,853	0	7,004	10,849	10,849	709	(49,820)	33
34		30,312	9,382	3,077	17,853	0	7,004	10,849	10,849	652	(49,168)	34
35		30,312	9,382	3,077	17,853	0	7,004	10,849	10,849	601	(48,567)	35
36		30,312	9,382	3,077	17,853	0	7,004	10,849	10,849	553	(48,014)	36
37		30,312	9,382	3,077	17,853	0	7,004	10,849	10,849	509	(47,505)	37
38		30,312	9,382	3,077	17,853	0	7,004	10,849	10,849	469	(47,037)	38
39		30,312	9,382	3,077	17,853	0	7,004	10,849	10,849	431	(46,605)	39
40		30,312	9,382	3,077	17,853	0	7,004	10,849	10,849	397	(46,208)	40
41		30,312	9,382	3,077	17,853	0	7,004	10,849	10,849	366	(45,843)	41
42		30,312	9,382	3,077	17,853	0	7,004	10,849	10,849	337	(45,506)	42
43		30,312	9,382	3,077	17,853	0	7,004	10,849	10,849	310	(45,196)	43
44		30,312	9,382	3,077	17,853	0	7,004	10,849	10,849	285	(44,911)	44
45		30,312	9,382	3,077	17,853	0	7,004	10,849	10,849	263	(44,648)	45
46		30,312	9,382	3,077	17,853	0	7,004	10,849	10,849	242	(44,406)	46
47		30,312	9,382	3,077	17,853	0	7,004	10,849	10,849	223	(44,183)	47
48		30,312	9,382	3,077	17,853	0	7,004	10,849	10,849	205	(43,978)	48
49		30,312	9,382	3,077	17,853	0	7,004	10,849	10,849	189	(43,790)	49
50		30,312	9,382	3,077	17,853	0	7,004	10,849	10,849	174	(43,616)	50
51		30,312	9,382	3,077	17,853	0	7,004	10,849	10,849	160	(43,456)	51
52		30,312	9,382	3,077	17,853	0	7,004	10,849	10,849	147	(43,309)	52
53		30,312	9,382	3,077	17,853	0	7,004	10,849	10,849	136	(43,173)	53
54		30,312	9,382	3,077	17,853	0	7,004	10,849	10,849	125	(43,048)	54
55		30,312	9,382	3,077	17,853	0	7,004	10,849	10,849	115	(42,933)	55
56		30,312	9,382	3,077	17,853	0	7,004	10,849	(195,952)	(1,911)	(44,844)	56
Total	206,801	1,697,472	525,392	172,312	999,768	206,801	311,081	481,886	275,085	(44,844)	(4,237,676)	

ATTACHMENT RR-DTE-136 (a)

Revenue Producing Plants Additions
Account 367 (Mains) > \$100K

List No. 14 (on DTE-3-22 Revised)

POST CONSTRUCTION - RATE OF RETURN ESTIMATE

WORKPAPER

Project: Philips Academy - Waverly Road
North Andover

Total Capital and O&M Costs

Meter Counts, Mcf Load and Net Revenue

Capital			Meter Counts	1
Mains	\$	290,959	Load (Mcf)	102,900
Services		1,579		
Meters		500		
Marginal Capital		30,051	Net Revenue	\$ 125,530 annual
Total	\$	323,089		
O & M costs	\$	7,358 annual		
Property Tax Rate	\$	16.35 per thousand		

Results Summary

* IRR	15 Yrs.
* NPV	22.20%
* Customer Contribution	\$297,063
	\$0

Year	Investment	Revenue	O&M	Property Tax	Profit Before Taxes	Depreciation 20 Year Class	Income Taxes	Total Net Income	Total Net Cash Flow (\$323,089)	P.V. OF Cash Flow (\$323,089)	Payback Calculation (\$323,089)	Payback Period
1	\$323,089	\$125,530	\$7,358	\$5,282	\$112,890	\$12,116	\$39,534	\$61,240	\$73,356	67,535	(129,516)	0
2		125,530	7,358	5,282	112,890	23,324	35,137	54,429	77,253	65,902	(189,652)	2
3		125,530	7,358	5,282	112,890	21,573	35,824	55,494	77,066	60,136	(74,608)	3
4		125,530	7,358	5,282	112,890	19,957	36,458	56,475	76,432	54,908	(24,446)	4
5		125,530	7,358	5,282	112,890	18,458	37,046	57,386	75,844	45,851	21,405	5
6		125,530	7,358	5,282	112,890	17,075	37,588	58,227	74,799	38,363	101,698	6
7		125,530	7,358	5,282	112,890	15,793	38,091	59,006	74,259	35,283	136,981	7
8		125,530	7,358	5,282	112,890	14,610	38,555	59,725	74,259	32,482	169,463	8
9		125,530	7,358	5,282	112,890	14,416	38,631	59,843	74,257	29,905	199,367	9
10		125,530	7,358	5,282	112,890	14,416	38,631	59,843	74,257	27,531	226,898	10
11		125,530	7,358	5,282	112,890	14,416	38,631	59,843	74,257	25,347	252,245	11
12		125,530	7,358	5,282	112,890	14,416	38,631	59,843	74,257	23,335	275,580	12
13		125,530	7,358	5,282	112,890	14,416	38,631	59,843	74,257	21,483	297,063	13
14		125,530	7,358	5,282	112,890	14,416	38,631	59,843	74,257	19,778	316,841	14
15		125,530	7,358	5,282	112,890	14,416	38,631	59,843	74,257	18,209	335,050	15
16		125,530	7,358	5,282	112,890	14,416	38,631	59,843	74,257	16,763	351,813	16
17		125,530	7,358	5,282	112,890	14,416	38,631	59,843	74,257	15,433	367,247	17
18		125,530	7,358	5,282	112,890	14,416	38,631	59,843	74,257	14,208	381,455	18
19		125,530	7,358	5,282	112,890	14,416	38,631	59,843	74,257	13,126	394,038	19
20		125,530	7,358	5,282	112,890	14,416	38,631	59,843	74,257	12,126	405,164	20
21		125,530	7,358	5,282	112,890	7,208	41,459	64,223	71,431	10,243	415,406	21
22		125,530	7,358	5,282	112,890	0	44,287	68,603	68,603	9,430	424,836	22
23		125,530	7,358	5,282	112,890	0	44,287	68,603	68,603	8,682	433,518	23
24		125,530	7,358	5,282	112,890	0	44,287	68,603	68,603	7,993	441,511	24
25		125,530	7,358	5,282	112,890	0	44,287	68,603	68,603	7,358	448,869	25
26		125,530	7,358	5,282	112,890	0	44,287	68,603	68,603	6,774	455,643	26
27		125,530	7,358	5,282	112,890	0	44,287	68,603	68,603	6,237	461,880	27
28		125,530	7,358	5,282	112,890	0	44,287	68,603	68,603	5,742	467,622	28
29		125,530	7,358	5,282	112,890	0	44,287	68,603	68,603	5,286	472,908	29
30		125,530	7,358	5,282	112,890	0	44,287	68,603	68,603	4,867	477,775	30
31		125,530	7,358	5,282	112,890	0	44,287	68,603	68,603	4,480	482,255	31
32		125,530	7,358	5,282	112,890	0	44,287	68,603	68,603	4,125	486,380	32
33		125,530	7,358	5,282	112,890	0	44,287	68,603	68,603	3,798	490,178	33
34		125,530	7,358	5,282	112,890	0	44,287	68,603	68,603	3,496	493,674	34
35		125,530	7,358	5,282	112,890	0	44,287	68,603	68,603	3,219	496,893	35
36		125,530	7,358	5,282	112,890	0	44,287	68,603	68,603	2,963	499,856	36
37		125,530	7,358	5,282	112,890	0	44,287	68,603	68,603	2,728	502,584	37
38		125,530	7,358	5,282	112,890	0	44,287	68,603	68,603	2,512	505,096	38
39		125,530	7,358	5,282	112,890	0	44,287	68,603	68,603	2,312	507,408	39
40		125,530	7,358	5,282	112,890	0	44,287	68,603	68,603	2,129	509,537	40
41		125,530	7,358	5,282	112,890	0	44,287	68,603	68,603	1,960	511,497	41
42		125,530	7,358	5,282	112,890	0	44,287	68,603	68,603	1,804	513,301	42
43		125,530	7,358	5,282	112,890	0	44,287	68,603	68,603	1,661	514,962	43
44		125,530	7,358	5,282	112,890	0	44,287	68,603	68,603	1,529	516,491	44
45		125,530	7,358	5,282	112,890	0	44,287	68,603	68,603	1,408	517,899	45
46		125,530	7,358	5,282	112,890	0	44,287	68,603	68,603	1,296	519,195	46
47		125,530	7,358	5,282	112,890	0	44,287	68,603	68,603	1,193	520,389	47
48		125,530	7,358	5,282	112,890	0	44,287	68,603	68,603	1,099	521,487	48
49		125,530	7,358	5,282	112,890	0	44,287	68,603	68,603	1,011	522,499	49
50		125,530	7,358	5,282	112,890	0	44,287	68,603	68,603	931	523,430	50
51		125,530	7,358	5,282	112,890	0	44,287	68,603	68,603	857	524,287	51
52		125,530	7,358	5,282	112,890	0	44,287	68,603	68,603	789	525,077	52
53		125,530	7,358	5,282	112,890	0	44,287	68,603	68,603	727	525,803	53
54		125,530	7,358	5,282	112,890	0	44,287	68,603	68,603	(254,486)	523,322	54
55		125,530	7,358	5,282	112,890	0	44,287	68,603	68,603	(2,482)	20,052,244	55
56		125,530	7,358	5,282	112,890	0	44,287	68,603	68,603			56
Total	323,089	7,029,680	412,048	295,792	6,321,840	323,089	2,353,310	3,645,441	3,322,352	523,322		

BAY ST

ORDER

PRE-CONSTRUCTION

Bay State Gas Company

DIVISION:

Lawrence

AU

IRR

RATE OF RETURN

12.80 %

DESCRIPTION/COMMENTS:

Install approximately 4750' of 12" CS along Waverly Rd. No. Andover from Sutton St. to Mass. Ave. This main installation will parallel our existing 8" high pressure main and is being installed as a system improvement for added load at Phillips Academy.

Main replacements are also required on Abbott Bridge Dr. and Eastman Rd. in Andover for a cost

of \$102,098

Meter Cost = \$23,300

Total Project Cost = \$372,745

DOWNTOWN

SUBURBS

X

BUILDER POLICY

CUST CONTR \$

COST RECORD	SOURCE	BUDGET	ACTUAL	VARIANCE	START DATE
MATERIAL		\$67,774			COMP DATE
LABOR		\$1,360			ESTIMATOR R. Levesque
CONTR.		\$171,076			PROG/NO
OVERHEAD		\$7,137			COMPLETE YES / NO
TOTAL		\$247,347			SUPPLEMENT YES / NO

	STREET & TOWN	SIZE	TYPE	EST	FINAL	ACCOUNT NUMBER	DIST %	COST PER FOOT
1	Waverly Rd., No. Andover	12"	CS	4750'				
2	To be installed	1991	construction					
3								
4								
5								
6								

	PIPE RETIRED	SIZE	TYPE	EST	FINAL	ACCOUNT NUMBER	INST YR	COST PER FOOT
1								
2								
3								
4								
5								
6								

EX ALL THAT APPLY

EXTENSION	X	GROWTH	X	APPROVAL UNDER \$25K
REPLACEMENT		BUILDER POLICY		DEPT MGR
MUNICIPAL IMP.		CONTRIBUTION		DIV. ENG.
SYSTEM IMP.		CO. LABOR		DIV. MGR.
NO. OF SERVICES		SPECIAL CREWS	X	APPROVAL OVER \$25K
RATE OF RETURN		RESIDENTIAL		CORP. MARKET
BUDGETED		COMM. INDUST.	X	SR. V.P. OPER.
PERMIT RECEIVED		PRESSURE	X	CORP. CTO

ATTACHMENT RR-DTE-136 (a)

Revenue Producing Plants Additions
Account 367 (Mains) > \$100K

List No. 15 (on DTE-3-22 Revised)

POST CONSTRUCTION - RATE OF RETURN ESTIMATE

WORKPAPER

Project: South West Street
Agawam

Total Capital and O&M Costs

Meter Counts, Mcf Load and Net Revenue

Capital
Mains \$ 144,449
Services 62,776
Meters 6,844
Marginal Capital 8,198
Total \$ 222,267

Meter Counts 59
Load (Mcf) 7,729
Net Revenue \$ 28,806 annual

O & M costs \$ 9,590 annual

Property Tax Rate \$ 19.44 per thousand

Results Summary

* IRR 55 Yrs. 5.06%
* NPV (\$76,090)
* Customer Contribution \$125,210

Year	Investment	Revenue	O&M	Property Tax	Profit Before Taxes	Depreciation 20 Year Class	Income Taxes	Total Net Income	Total Net Cash Flow (\$222,267)	P.V. OF Cash Flow (\$222,267)	Payback Calculation (\$222,267)	Payback Period
1	\$222,267	\$28,806	\$9,590	\$4,321	\$14,895	\$8,335	\$2,573	\$3,987	\$12,322	11,344	(\$210,923)	1
2		28,806	9,590	4,321	14,895	16,045	(951)	(699)	15,346	13,607	(197,916)	2
3		28,806	9,590	4,321	14,895	14,841	21	33	14,874	11,606	(186,310)	3
4		28,806	9,590	4,321	14,895	13,729	457	708	14,438	10,372	(175,938)	4
5		28,806	9,590	4,321	14,895	12,698	862	1,335	14,033	9,281	(166,657)	5
6		28,806	9,590	4,321	14,895	11,747	1,735	1,913	13,660	8,317	(158,339)	6
7		28,806	9,590	4,321	14,895	10,864	1,581	2,449	13,314	7,463	(150,876)	7
8		28,806	9,590	4,321	14,895	10,051	1,990	2,944	12,995	6,706	(144,170)	8
9		28,806	9,590	4,321	14,895	9,918	1,953	3,025	12,942	6,149	(138,020)	9
10		28,806	9,590	4,321	14,895	9,915	1,954	3,026	12,941	5,661	(132,359)	10
11		28,806	9,590	4,321	14,895	9,918	1,953	3,025	12,942	5,212	(127,147)	11
12		28,806	9,590	4,321	14,895	9,915	1,954	3,026	12,941	4,798	(122,349)	12
13		28,806	9,590	4,321	14,895	9,918	1,953	3,025	12,942	4,418	(117,932)	13
14		28,806	9,590	4,321	14,895	9,915	1,954	3,026	12,941	4,067	(113,865)	14
15		28,806	9,590	4,321	14,895	9,918	1,953	3,025	12,942	3,744	(110,121)	15
16		28,806	9,590	4,321	14,895	9,915	1,954	3,026	12,941	3,447	(106,674)	16
17		28,806	9,590	4,321	14,895	9,918	1,953	3,025	12,942	3,174	(103,500)	17
18		28,806	9,590	4,321	14,895	9,915	1,954	3,026	12,941	2,922	(100,579)	18
19		28,806	9,590	4,321	14,895	9,918	1,953	3,025	12,942	2,690	(97,889)	19
20		28,806	9,590	4,321	14,895	9,915	1,954	3,026	12,941	2,476	(95,413)	20
21		28,806	9,590	4,321	14,895	4,959	3,898	6,038	10,997	1,937	(93,475)	21
22		28,806	9,590	4,321	14,895	0	5,843	9,052	9,052	1,468	(92,008)	22
23		28,806	9,590	4,321	14,895	0	5,843	9,052	9,052	1,351	(90,656)	23
24		28,806	9,590	4,321	14,895	0	5,843	9,052	9,052	1,244	(89,412)	24
25		28,806	9,590	4,321	14,895	0	5,843	9,052	9,052	1,145	(88,266)	25
26		28,806	9,590	4,321	14,895	0	5,843	9,052	9,052	1,055	(87,212)	26
27		28,806	9,590	4,321	14,895	0	5,843	9,052	9,052	971	(86,241)	27
28		28,806	9,590	4,321	14,895	0	5,843	9,052	9,052	894	(85,347)	28
29		28,806	9,590	4,321	14,895	0	5,843	9,052	9,052	823	(84,524)	29
30		28,806	9,590	4,321	14,895	0	5,843	9,052	9,052	758	(83,767)	30
31		28,806	9,590	4,321	14,895	0	5,843	9,052	9,052	697	(83,069)	31
32		28,806	9,590	4,321	14,895	0	5,843	9,052	9,052	642	(82,427)	32
33		28,806	9,590	4,321	14,895	0	5,843	9,052	9,052	591	(81,836)	33
34		28,806	9,590	4,321	14,895	0	5,843	9,052	9,052	544	(81,292)	34
35		28,806	9,590	4,321	14,895	0	5,843	9,052	9,052	501	(80,791)	35
36		28,806	9,590	4,321	14,895	0	5,843	9,052	9,052	461	(80,329)	36
37		28,806	9,590	4,321	14,895	0	5,843	9,052	9,052	425	(79,905)	37
38		28,806	9,590	4,321	14,895	0	5,843	9,052	9,052	391	(79,514)	38
39		28,806	9,590	4,321	14,895	0	5,843	9,052	9,052	360	(79,154)	39
40		28,806	9,590	4,321	14,895	0	5,843	9,052	9,052	331	(78,822)	40
41		28,806	9,590	4,321	14,895	0	5,843	9,052	9,052	305	(78,517)	41
42		28,806	9,590	4,321	14,895	0	5,843	9,052	9,052	281	(78,236)	42
43		28,806	9,590	4,321	14,895	0	5,843	9,052	9,052	259	(77,978)	43
44		28,806	9,590	4,321	14,895	0	5,843	9,052	9,052	238	(77,740)	44
45		28,806	9,590	4,321	14,895	0	5,843	9,052	9,052	219	(77,520)	45
46		28,806	9,590	4,321	14,895	0	5,843	9,052	9,052	202	(77,319)	46
47		28,806	9,590	4,321	14,895	0	5,843	9,052	9,052	186	(77,133)	47
48		28,806	9,590	4,321	14,895	0	5,843	9,052	9,052	171	(76,962)	48
49		28,806	9,590	4,321	14,895	0	5,843	9,052	9,052	157	(76,804)	49
50		28,806	9,590	4,321	14,895	0	5,843	9,052	9,052	145	(76,659)	50
51		28,806	9,590	4,321	14,895	0	5,843	9,052	9,052	133	(76,526)	51
52		28,806	9,590	4,321	14,895	0	5,843	9,052	9,052	123	(76,403)	52
53		28,806	9,590	4,321	14,895	0	5,843	9,052	9,052	113	(76,290)	53
54		28,806	9,590	4,321	14,895	0	5,843	9,052	9,052	104	(76,186)	54
55		28,806	9,590	4,321	14,895	0	5,843	9,052	9,052	96	(76,090)	55
56		28,806	9,590	4,321	14,895	0	5,843	9,052	(213,215)	(2,079)	(78,169)	56
Total	222,267	1,613,136	537,040	241,976	834,120	222,267	240,030	371,823	149,556	(78,169)	(5,901,820)	

Southwest Street

INPUT ==>

Customer Count	Capital	Marginal Capital	Total Capital	Net Revenue	Customer Rebates	O & M Expended	Property Tax	Discount Rate
Yr 1	179,593	12,212	\$191,807	\$28,806	0	\$183	\$18.20	8.55%
Yr 2	424,360	1,656	26,016	\$11,718				
Yr 3	17,235	1,173	18,428	\$8,900				
Total	100	\$221,210	\$15,042	\$236,252	\$48,824			

OUTPUT ==>

IRR	NPV	10 Years	15 Years	20 Years	25 Years	30 Years
-2.21%	3.89%	6.35%	7.36%	8.57%		
(\$97,955)	(\$60,173)	(\$35,701)	(\$22,065)	\$416		

DCF Analysis

Year	Net Revenue	O & M Expended	Customer Rebates	Prop. Tax	Profit & Tax	Deprec. Sch.	Deprec. Amount	Income Tax	Net Cash Flow	PV Cash Flow	Pay Back	Year
1	28,806	9,617	0	3,491	15,698	0.0375	7,193	3,337	(13,655)	(191,807)	(204,357)	1
2	40,524	13,528		3,964	23,031	0.0722	14,822	3,220	1,382	(12,579)	(203,214)	2
3	48,824	16,300		4,300	28,224	0.0668	15,376	5,040	23,184	18,126	(185,088)	3
4	48,824	16,300		4,300	28,224	0.0618	14,915	5,221	23,003	16,568	(168,520)	4
5	48,824	16,300		4,300	28,224	0.0571	13,795	5,660	22,564	14,971	(153,549)	5
6	48,824	16,300		4,300	28,224	0.0529	12,762	6,066	22,158	12,266	(140,004)	6
7	48,824	16,300		4,300	28,224	0.0489	11,803	6,442	21,782	10,120	(127,739)	7
8	48,824	16,300		4,300	28,224	0.0452	10,819	6,789	21,435	8,394	(116,619)	8
9	48,824	16,300		4,300	28,224	0.0440	10,541	6,900	21,324	6,750	(106,428)	9
10	48,824	16,300		4,300	28,224	0.0440	10,541	6,937	21,287	5,277	(97,055)	10
11	48,824	16,300		4,300	28,224	0.0446	10,541	6,938	21,286	4,126	(88,421)	11
12	48,824	16,300		4,300	28,224	0.0446	10,541	6,937	21,287	3,301	(80,468)	12
13	48,824	16,300		4,300	28,224	0.0446	10,541	6,937	21,286	2,912	(73,141)	13
14	48,824	16,300		4,300	28,224	0.0446	10,541	6,937	21,287	2,622	(66,391)	14
15	48,824	16,300		4,300	28,224	0.0446	10,541	6,937	21,286	2,394	(60,173)	15
16	48,824	16,300		4,300	28,224	0.0446	10,541	6,937	21,287	2,208	(54,445)	16
17	48,824	16,300		4,300	28,224	0.0446	10,541	6,937	21,286	2,032	(49,167)	17
18	48,824	16,300		4,300	28,224	0.0446	10,541	6,937	21,287	1,872	(44,306)	18
19	48,824	16,300		4,300	28,224	0.0446	10,541	6,937	21,286	1,725	(39,827)	19
20	48,824	16,300		4,300	28,224	0.0446	10,541	6,937	21,287	1,589	(35,701)	20
21	48,824	16,300		4,300	28,224	0.0446	10,541	6,937	21,286	1,464	(32,200)	21
22	48,824	16,300		4,300	28,224	0.0446	10,541	6,937	21,287	1,348	(29,288)	22
23	48,824	16,300		4,300	28,224	0.0446	10,541	6,937	21,286	1,242	(26,685)	23
24	48,824	16,300		4,300	28,224	0.0446	10,541	6,937	21,287	1,144	(24,270)	24
25	48,824	16,300		4,300	28,224	0.0446	10,541	6,937	21,286	1,054	(22,065)	25
26	48,824	16,300		4,300	28,224	0.0446	10,541	6,937	21,287	971	(20,033)	26
27	48,824	16,300		4,300	28,224	0.0446	10,541	6,937	21,286	895	(18,161)	27
28	48,824	16,300		4,300	28,224	0.0446	10,541	6,937	21,287	824	(16,436)	28
29	48,824	16,300		4,300	28,224	0.0446	10,541	6,937	21,286	759	(14,847)	29
30	48,824	16,300		4,300	28,224	0.0446	10,541	6,937	21,287	699	(13,384)	30
31	48,824	16,300		4,300	28,224	0.0446	10,541	6,937	21,286	644	(12,035)	31
32	48,824	16,300		4,300	28,224	0.0446	10,541	6,937	21,287	594	(10,793)	32
33	48,824	16,300		4,300	28,224	0.0446	10,541	6,937	21,286	547	(9,649)	33
34	48,824	16,300		4,300	28,224	0.0446	10,541	6,937	21,287	504	(8,595)	34
35	48,824	16,300		4,300	28,224	0.0446	10,541	6,937	21,286	464	(7,624)	35
36	48,824	16,300		4,300	28,224	0.0446	10,541	6,937	21,287	424	(6,729)	36
37	48,824	16,300		4,300	28,224	0.0446	10,541	6,937	21,286	384	(5,905)	37
38	48,824	16,300		4,300	28,224	0.0446	10,541	6,937	21,287	344	(5,146)	38
39	48,824	16,300		4,300	28,224	0.0446	10,541	6,937	21,286	304	(4,446)	39
40	48,824	16,300		4,300	28,224	0.0446	10,541	6,937	21,287	264	(3,802)	40
41	48,824	16,300		4,300	28,224	0.0446	10,541	6,937	21,286	224	(3,208)	41
42	48,824	16,300		4,300	28,224	0.0446	10,541	6,937	21,287	184	(2,662)	42
43	48,824	16,300		4,300	28,224	0.0446	10,541	6,937	21,286	144	(2,159)	43
44	48,824	16,300		4,300	28,224	0.0446	10,541	6,937	21,287	104	(1,694)	44
45	48,824	16,300		4,300	28,224	0.0446	10,541	6,937	21,286	64	(1,286)	45
46	48,824	16,300		4,300	28,224	0.0446	10,541	6,937	21,287	24	(872)	46
47	48,824	16,300		4,300	28,224	0.0446	10,541	6,937	21,286	-16	(509)	47
48	48,824	16,300		4,300	28,224	0.0446	10,541	6,937	21,287	-152	(175)	48
49	48,824	16,300		4,300	28,224	0.0446	10,541	6,937	21,286	-284	133	49
50	48,824	16,300		4,300	28,224	0.0446	10,541	6,937	21,287	-284	416	50

PRE-CONSTRUCTION IRR

Memo Aug. 12, 1994

To: Fred Paine
From:: Bruce Farnsworth
Re: Approval request for ROR

I am requesting corporate approval of a proposed main extension on Southwest and Barry Streets, Joanne Circle, Kathy Terrace, Gina Drive, Barbara and Sharon Lakes in Feeding Hills, Ma. The 3 year expansion improvement rate of return calls for a total of 100 houses. I have 53 commitments to date with at least 8 more expected to be signed up this year. We should have no problem achieving this ROR because most of the homes in this area are *electric*. Year two calls for 24 more customers to be added, and year three requires 17.

Total capital costs for the 3 year project are:

Year 1	\$191,807
Year 2	\$26,016
Year 3	\$18,428
TOTAL	\$236,252

This area was canvassed by the student help recently, and was preceded by an off the main mailing about 2 years ago. Several residents even signed a neighborhood petition requesting gas be made available to them. Unfortunately, some of these people could not wait for Baystate Gas to bring the main down their street, so they have already converted from electric to propane or oil, rather than continue to endure the *high electric rates*. I have been successful in convincing some of these recently converted prospects to convert again.....to NATURAL GAS.

ATTACHMENT RR-DTE-136 (a)

Revenue Producing Plants Additions
Account 367 (Mains) > \$100K

List No. 16 (on DTE-3-22 Revised)

POST CONSTRUCTION - RATE OF RETURN ESTIMATE

WORKPAPER

Project: Electric Park
Ludlow

Total Capital and O&M Costs

Capital		
Mains	\$	290,679
Services		147,204
Meters		7,191
Marginal Capital		13,260
Total	\$	458,274

Meter Counts, Mcf Load and Net Revenue

Meter Counts	141
Load (Mcf)	16,779
Net Revenue	\$ 59,962 annual

O & M costs \$ 23,030 annual

Property Tax Rate \$ 16.40 per thousand

Results Summary

	55 Yrs.
* IRR	4.83%
* NPV	(\$165,915)
* Customer Contribution	\$273,021

Year	Investment	Revenue	O&M	Property Tax	Before Taxes	Profit 20 Year Class	Income Taxes	Total Net Income	Total Net Cash Flow (\$458,274)	P.V. OF Cash Flow (\$458,274)	Payback Calculation (\$458,274)	Payback Period
1	\$458,274	\$59,962	\$23,030	\$7,516	\$29,416	\$17,185	\$4,798	\$7,433	\$24,618	22,664	(\$435,610)	1
2		59,962	23,030	7,516	29,416	33,083	(1,438)	(2,228)	30,854	26,152	(409,458)	2
3		59,962	23,030	7,516	29,416	30,599	(464)	(719)	29,880	23,316	(386,142)	3
4		59,962	23,030	7,516	29,416	28,308	435	674	28,981	20,820	(365,322)	4
5		59,962	23,030	7,516	29,416	26,181	1,269	1,966	28,147	18,616	(346,707)	5
6		59,962	23,030	7,516	29,416	24,720	2,038	3,158	27,378	16,670	(320,037)	6
7		59,962	23,030	7,516	29,416	22,400	2,782	4,263	26,664	14,947	(301,690)	7
8		59,962	23,030	7,516	29,416	20,723	3,410	5,283	26,006	13,421	(301,668)	8
9		59,962	23,030	7,516	29,416	20,448	3,518	5,450	25,898	12,305	(289,364)	9
10		59,962	23,030	7,516	29,416	20,444	3,520	5,453	25,896	11,328	(278,036)	10
11		59,962	23,030	7,516	29,416	20,448	3,518	5,450	25,898	10,429	(267,607)	11
12		59,962	23,030	7,516	29,416	20,444	3,520	5,453	25,896	9,601	(258,006)	12
13		59,962	23,030	7,516	29,416	20,448	3,518	5,450	25,898	8,840	(249,166)	13
14		59,962	23,030	7,516	29,416	20,444	3,520	5,453	25,896	8,138	(241,028)	14
15		59,962	23,030	7,516	29,416	20,448	3,518	5,450	25,898	7,492	(233,536)	15
16		59,962	23,030	7,516	29,416	20,444	3,520	5,453	25,896	6,897	(226,639)	16
17		59,962	23,030	7,516	29,416	20,448	3,518	5,450	25,898	6,350	(220,288)	17
18		59,962	23,030	7,516	29,416	20,444	3,520	5,453	25,896	5,846	(214,442)	18
19		59,962	23,030	7,516	29,416	20,448	3,518	5,450	25,898	5,382	(209,060)	19
20		59,962	23,030	7,516	29,416	20,444	3,520	5,453	25,896	4,955	(204,163)	20
21		59,962	23,030	7,516	29,416	10,224	7,329	11,663	21,887	3,856	(200,249)	21
22		59,962	23,030	7,516	29,416	0	11,540	17,876	17,876	2,899	(197,350)	22
23		59,962	23,030	7,516	29,416	0	11,540	17,876	17,876	2,669	(194,681)	23
24		59,962	23,030	7,516	29,416	0	11,540	17,876	17,876	2,457	(192,224)	24
25		59,962	23,030	7,516	29,416	0	11,540	17,876	17,876	2,262	(189,962)	25
26		59,962	23,030	7,516	29,416	0	11,540	17,876	17,876	2,083	(187,879)	26
27		59,962	23,030	7,516	29,416	0	11,540	17,876	17,876	1,917	(185,962)	27
28		59,962	23,030	7,516	29,416	0	11,540	17,876	17,876	1,765	(184,197)	28
29		59,962	23,030	7,516	29,416	0	11,540	17,876	17,876	1,625	(182,572)	29
30		59,962	23,030	7,516	29,416	0	11,540	17,876	17,876	1,496	(181,075)	30
31		59,962	23,030	7,516	29,416	0	11,540	17,876	17,876	1,377	(179,698)	31
32		59,962	23,030	7,516	29,416	0	11,540	17,876	17,876	1,268	(178,430)	32
33		59,962	23,030	7,516	29,416	0	11,540	17,876	17,876	1,167	(177,262)	33
34		59,962	23,030	7,516	29,416	0	11,540	17,876	17,876	1,075	(176,188)	34
35		59,962	23,030	7,516	29,416	0	11,540	17,876	17,876	990	(175,198)	35
36		59,962	23,030	7,516	29,416	0	11,540	17,876	17,876	911	(174,287)	36
37		59,962	23,030	7,516	29,416	0	11,540	17,876	17,876	839	(173,448)	37
38		59,962	23,030	7,516	29,416	0	11,540	17,876	17,876	772	(172,676)	38
39		59,962	23,030	7,516	29,416	0	11,540	17,876	17,876	711	(171,965)	39
40		59,962	23,030	7,516	29,416	0	11,540	17,876	17,876	654	(171,311)	40
41		59,962	23,030	7,516	29,416	0	11,540	17,876	17,876	603	(170,708)	41
42		59,962	23,030	7,516	29,416	0	11,540	17,876	17,876	555	(170,154)	42
43		59,962	23,030	7,516	29,416	0	11,540	17,876	17,876	511	(169,643)	43
44		59,962	23,030	7,516	29,416	0	11,540	17,876	17,876	470	(169,173)	44
45		59,962	23,030	7,516	29,416	0	11,540	17,876	17,876	433	(168,740)	45
46		59,962	23,030	7,516	29,416	0	11,540	17,876	17,876	398	(168,341)	46
47		59,962	23,030	7,516	29,416	0	11,540	17,876	17,876	367	(167,975)	47
48		59,962	23,030	7,516	29,416	0	11,540	17,876	17,876	338	(167,637)	48
49		59,962	23,030	7,516	29,416	0	11,540	17,876	17,876	311	(167,326)	49
50		59,962	23,030	7,516	29,416	0	11,540	17,876	17,876	286	(167,040)	50
51		59,962	23,030	7,516	29,416	0	11,540	17,876	17,876	264	(166,776)	51
52		59,962	23,030	7,516	29,416	0	11,540	17,876	17,876	243	(166,533)	52
53		59,962	23,030	7,516	29,416	0	11,540	17,876	17,876	223	(166,310)	53
54		59,962	23,030	7,516	29,416	0	11,540	17,876	17,876	206	(166,104)	54
55		59,962	23,030	7,516	29,416	0	11,540	17,876	17,876	189	(165,915)	55
56		59,962	23,030	7,516	29,416	0	11,540	17,876	17,876	(440,398)	(4,294)	(170,209)
Total	458,274	3,357,872	1,289,680	420,896	1,647,296	458,274	466,453	722,569	264,295	(170,209)	(12,574,784)	

BAY STATE GAS CO. MAIN ORDER

DIVISION SP AUTH. NO:2- MNERC RATE OF RETURN D.I.E. 05-27

DESCRIPTION / COMMENTS: This authorization covers the cost to install Attachment RR-DTE-136(a)
of 4" and 17,500 feet of 2" IP main in electric park in Ludlow Page 71 of 73

PRE-CONSTRUCTION
IRR

DOWNTOWN SUBURBS X BUILDER POLICY CUST. CONTR. \$

COST RECORD	SOURCE	BUDGET	ACTUAL	VARIANCE
MATERIAL		37,850		
LABOR		321,180		
CONTRACTOR				
OVERHEAD				
TOTAL		359,030		

START DATE / / 1992

COMP. DATE / / 1992

ESTIMATOR TD

PROG NO. / NOMAD

COMPLETE	Y	N
SUPPLEMENT	Y	N

PIPE INSTALLED: FROM:

TO:

	STREET NAME & TOWN	SIZE	TYPE	FOOTAGE EST. FINAL	ACCOUNT NUMBER	DIST %	COST PER FT
1	see attached sheet						
2							
3							
4							
5							
6							

	PIPE RETIRED	SIZE	TYPE	FOOTAGE EST. FINAL	ACCOUNT NUMBER	INST. YR.	COST PER FT
1							
2							
3							
4							
5							

TYPE: 'X' OFF ALL WHICH APPLY

EXTENSION 5920

X

GROWTH

X

REPLACEMENT

BUILDER POLICY

MUNICIPAL IMP.

CONTRIBUTION

SYSTEM IMP.

CO. LABOR

NO. OF SERVICES

SPECIAL CREWS

RATE OF RETURN

RESIDENTIAL

BUDGETED

COMM. INDUST.

PERMIT RECEIVED

PRESSURE

X

IP

ACCOUNTING INFO CLOSE TO PLANT

APPROVAL: UNDER \$25K

DEPT. MGR.

DIV. ENG.

DIV. MGR.

APPROVAL: OVER \$25K

CORP. MARKET

SR. V.P. OPER.

CORP. C.F.O.

Massachusetts Internal Rate of Return
Residential

Scenario:
Development Name
Address
Town

Best Case
Electric Park
Ludlow
241

Division
Number of Meters

Springfield
300

Proposed Heat Load Mcf
Proposed Base Load Mcf
Total Load

28,500
7,200
35,700

Rate Schedule (year 1)

Heating	N/A
Heat Load per Meter	95
Base Load per Meter	24
Load Per Meter	119

Estimated Cost:

Main \$359,020
Service 180,000
Meter & Fit 15,300
Direct Overheads 0
System Improvements 0
Marginal Costs 28,085
Project Total \$582,405
Cost per Meter \$1,941

Cash Flow Results

55 Year Return

Rate of return - IRR 8.78%
Customer Contribution \$0
* NPV \$9,852
* Net Payback (years) 43
* Net Gas Revenues 127,578
* Net Rate/MMBtu \$3.57
* Residential Other Revenues/MTR \$0.00
* Incentives/MTR \$0.00

Results (Income Basis)

Net Gas Revenues
O&M
Depreciation
Property Taxes
Operating Income
Interest Expense
Income Taxes
Net Income

Year 1	Year 2	Year 3	Year 4
\$127,578	\$127,578	\$127,578	\$127,578
48,999	48,999	48,999	48,999
11,648	23,296	23,296	23,296
9,551	9,551	9,551	9,551
\$7,379	45,731	45,731	45,731
20,559	20,559	20,559	20,559
14,445	9,875	9,875	9,875
\$22,375	\$10,727	\$15,297	\$15,297

Longyard road ROR.xls

PRE-CONSTRUCTION
IRR

THIS INTERNAL RATE OF RETURN WAS

RE_CALCULATED WITH DATA FROM THE ORIGINAL

WORKSHEET - LABELED "ELECTRIC PARK WORKSHEET"

PRE-CONSTRUCTION IRR

SPRINGFIELD DIVISION
POTENTIAL MAIN EXTENSIONS
RESIDENTIAL NEW SALES FORECAST

"ELECTRIC PARK WORKSHEET"

TOWN: LUDLOW	STREETS	# HOMES	HTG SYS	SQ FT *	FOOTAGE	MAIN COST (\$)	\$/FT	SERVICE COST (\$)**	METER COST (\$)	TOTAL COST
	ELECTRIC	4	ELEC	1,500	550	10,710	19.47	2,400	204	13,314
	VOLTAGE	15	ELEC	1,500	1,100	13,980	12.71	9,000	785	23,765
	POSNER	25	ELEC	1,500	1,900	27,225	14.33	15,000	1,275	43,500
	EDISON	22	ELEC	1,500	1,950	31,130	15.98	13,200	1,122	45,432
	IRLA	23	ELEC	1,500	1,400	16,400	11.71	9,000	1,173	26,573
	AMPERE	15	ELEC	1,500	850	12,810	15.07	9,000	785	22,595
	WATT	11	ELEC/OIL	1,500	650	9,940	15.29	6,600	561	17,101
	POWER	11	ELEC	1,500	850	14,440	16.99	6,600	561	21,601
	CIRCUIT	14	ELEC	1,500	700	9,415	13.45	8,400	714	18,529
	REYNOLDS	31	ELEC/OIL/PRP	2,000	2,250	29,270	13.01	18,600	1,581	49,451
	MAY	7	ELEC	1,500	500	7,700	15.40	4,200	357	12,257
	PONDVIEW	34	ELEC/OIL	1,500	2,200	28,960	13.16	20,400	1,734	51,094
	SALLI	25	ELEC/OIL	1,500	1,500	19,120	12.75	15,000	1,275	35,395
	NOWAK	4	ELEC	1,500	300	5,120	17.07	2,400	204	7,724
	HILL	14	ELEC/OIL	2,500	800	42,460	53.08	8,400	714	51,574
	CHAPIN	18	ELEC/OIL	2,500	1,400	22,830	16.31	10,800	918	34,548
	CHAPIN	10	ELEC/OIL	2,500	1,000	16,310	16.31	6,000	510	22,820
	CHAPIN	17	ELEC/OIL	2,500	1,600	41,200	25.75	10,200	887	52,287
	TOTAL	300		31,500	21,500	\$359,020	\$16.70	\$180,000	\$15,300	\$554,320

* AVERAGE HEAT LOAD: 95 MCF
** AVERAGE SERVICE LENGTH: 50 FT

(39) * Chapin from End of Main (last extension from Miller) to Reynolds

Revenue Producing Plant Additions Account 367 (Mains) > \$50K and < \$100K For Years 1992 through 2004							
Col. 1	Col. 2	Col. 3	Col. 4	Col. 5		Col. 12	Col. 13
List No.	Yr	Location	Internal Hurdle Rate for Project Approval (%)	Pre – Construct Estimated IRR (%)		Post - Construction IRR (%)	Project ID
1	2000	Lawrence / Clifton Street	10%	11%	1/	11%	L2000D0022
2	1999	Wrentham / Wrentham State School	8.75%	19%		2%	B99D0043
3	1998	Brockton / Battles Street	8.75%	12%	1/	13%	B98D0065
4	1998	Canton / Turnpike Street	8.75%	28%	1/	42%	B98D0125
5	1998	Wilbraham / The Woods	8.75%	14%		14%	S98D1038
6	1998	Monson / Bethany Road	8.75%	24%		23%	S98D1087
7	1997	Methuen / Archibald - Chestnut Hills	8.75%	12%		13%	L97D0013
8	1997	North Andover / Campbell Street	8.75%	9%	1/	4%	L97D0016
9	1995	Attleboro / Turner Street	9.58%	32%	1/	13%	B95D0072
10	1995	North Andover / Millpond Estates	9.58%	11%		17%	L95D0013
11	1995	North Andover / Edgewood Life Care	9.58%	21%	1/	16%	L95D0023
12	1995	Northampton / Coca Cola Plant	9.58%	47%	1/	59%	S95D1006
13	1995	Palmer / Mt. Dumpling Road	9.58%	9%	1/	7%	S95D1040
14	1994	Springfield / Thyme Street	8.55%	10%		3%	Thyme Street
15	1994	Bridgewater / Tarkin Hill Estates	8.55%	9%	1/	1%	B94D0068
16	1994	Mansfield / Stream Hill Estates	8.55%	13%	1/	14%	B94D0101
17	1992	Agawam / Red Fox Drive	8.55%	10%	1/	3%	Red Fox Dr.
18	1992	Southwick / College Highway	8.55%	20%	1/	2%	College Highway

1/ Detailed Pre – Construction Internal Rate of Return Analysis is not available for this project

ATTACHMENT RR-DTE-136 (b)

Revenue Producing Plants Additions
Account 367 (Mains) > \$50K and < \$100K

List No. / **(on DTE-3-27 Revised)**

POST CONSTRUCTION - RATE OF RETURN ESTIMATE

WORKPAPER

POST-CONSTRUCTION

Project: Clifton Street, Weatherbee School
Lawrence

Total Capital and O&M Costs

Meter Counts, Mef Load and Net Revenue

Capital			Meter Counts	2
Mains	\$	145,724	Load (Mcf)	25,019
Services		2,294		
Meters		0		
Marginal Capital		0	Net Revenue	\$ 35,963 annual
Total	\$	148,018		
O & M costs	\$	2,062 annual		
Property Tax Rate	\$	37.24 per thousand		

Results Summary

* IRR	15 Yrs.
* NPV	10.75%
* Customer Contribution	\$19,205
	\$0

Year	Investment	Revenue	O&M	Property Tax	Profit Before Taxes	Depreciation 20 Year Class	Income Taxes	Total Net Income	Total Net Cash Flow (\$148,018)	P.V. OF Cash Flow (\$148,018)	Payback Calculation (\$148,018)	Payback Period
1	\$148,018	\$35,963	\$2,062	\$5,512	\$28,389	\$5,551	\$8,959	\$13,879	\$19,430	17,888	(\$11,955)	0
2		35,963	2,062	5,512	28,389	10,685	6,945	10,758	21,444	18,175	(11,955)	1
3		35,963	2,062	5,512	28,389	9,883	7,260	11,246	21,129	16,487	(95,468)	3
4		35,963	2,062	5,512	28,389	9,143	7,550	11,696	20,839	14,970	(80,497)	4
5		35,963	2,062	5,512	28,389	8,456	7,820	12,113	20,569	13,604	(66,893)	5
6		35,963	2,062	5,512	28,389	7,823	8,068	12,498	20,321	12,373	(54,520)	6
7		35,963	2,062	5,512	28,389	7,235	8,299	12,855	20,090	11,262	(43,258)	7
8		35,963	2,062	5,512	28,389	6,693	8,511	13,184	19,878	10,259	(32,999)	8
9		35,963	2,062	5,512	28,389	6,605	8,546	13,238	19,843	9,428	(23,571)	9
10		35,963	2,062	5,512	28,389	6,603	8,547	13,239	19,842	8,680	(14,892)	10
11		35,963	2,062	5,512	28,389	6,605	8,546	13,238	19,843	7,991	(6,901)	11
12		35,963	2,062	5,512	28,389	6,603	8,547	13,239	19,842	7,357	456	12
13		35,963	2,062	5,512	28,389	6,605	8,546	13,238	19,843	6,773	7,229	13
14		35,963	2,062	5,512	28,389	6,603	8,547	13,239	19,842	6,235	13,464	14
15		35,963	2,062	5,512	28,389	6,605	8,546	13,238	19,843	5,741	19,205	15
16		35,963	2,062	5,512	28,389	6,603	8,547	13,239	19,842	5,285	24,490	16
17		35,963	2,062	5,512	28,389	6,605	8,546	13,238	19,843	4,866	29,355	17
18		35,963	2,062	5,512	28,389	6,603	8,547	13,239	19,842	4,479	33,835	18
19		35,963	2,062	5,512	28,389	6,605	8,546	13,238	19,843	4,124	37,959	19
20		35,963	2,062	5,512	28,389	6,603	8,547	13,239	19,842	3,797	41,755	20
21		35,963	2,062	5,512	28,389	3,302	9,842	15,245	18,547	3,267	45,023	21
22		35,963	2,062	5,512	28,389	0	11,137	17,252	17,252	2,798	47,821	22
23		35,963	2,062	5,512	28,389	0	11,137	17,252	17,252	2,576	50,396	23
24		35,963	2,062	5,512	28,389	0	11,137	17,252	17,252	2,371	52,768	24
25		35,963	2,062	5,512	28,389	0	11,137	17,252	17,252	2,183	54,951	25
26		35,963	2,062	5,512	28,389	0	11,137	17,252	17,252	2,010	56,961	26
27		35,963	2,062	5,512	28,389	0	11,137	17,252	17,252	1,850	58,811	27
28		35,963	2,062	5,512	28,389	0	11,137	17,252	17,252	1,704	60,515	28
29		35,963	2,062	5,512	28,389	0	11,137	17,252	17,252	1,568	62,083	29
30		35,963	2,062	5,512	28,389	0	11,137	17,252	17,252	1,444	63,527	30
31		35,963	2,062	5,512	28,389	0	11,137	17,252	17,252	1,329	64,857	31
32		35,963	2,062	5,512	28,389	0	11,137	17,252	17,252	1,224	66,080	32
33		35,963	2,062	5,512	28,389	0	11,137	17,252	17,252	1,127	67,207	33
34		35,963	2,062	5,512	28,389	0	11,137	17,252	17,252	1,037	68,244	34
35		35,963	2,062	5,512	28,389	0	11,137	17,252	17,252	955	69,199	35
36		35,963	2,062	5,512	28,389	0	11,137	17,252	17,252	879	70,079	36
37		35,963	2,062	5,512	28,389	0	11,137	17,252	17,252	809	70,888	37
38		35,963	2,062	5,512	28,389	0	11,137	17,252	17,252	745	71,633	38
39		35,963	2,062	5,512	28,389	0	11,137	17,252	17,252	686	72,319	39
40		35,963	2,062	5,512	28,389	0	11,137	17,252	17,252	632	72,951	40
41		35,963	2,062	5,512	28,389	0	11,137	17,252	17,252	581	73,532	41
42		35,963	2,062	5,512	28,389	0	11,137	17,252	17,252	535	74,068	42
43		35,963	2,062	5,512	28,389	0	11,137	17,252	17,252	493	74,561	43
44		35,963	2,062	5,512	28,389	0	11,137	17,252	17,252	454	75,014	44
45		35,963	2,062	5,512	28,389	0	11,137	17,252	17,252	418	75,432	45
46		35,963	2,062	5,512	28,389	0	11,137	17,252	17,252	385	75,817	46
47		35,963	2,062	5,512	28,389	0	11,137	17,252	17,252	354	76,171	47
48		35,963	2,062	5,512	28,389	0	11,137	17,252	17,252	326	76,497	48
49		35,963	2,062	5,512	28,389	0	11,137	17,252	17,252	300	76,797	49
50		35,963	2,062	5,512	28,389	0	11,137	17,252	17,252	276	77,073	50
51		35,963	2,062	5,512	28,389	0	11,137	17,252	17,252	254	77,327	51
52		35,963	2,062	5,512	28,389	0	11,137	17,252	17,252	234	77,562	52
53		35,963	2,062	5,512	28,389	0	11,137	17,252	17,252	216	77,777	53
54		35,963	2,062	5,512	28,389	0	11,137	17,252	17,252	198	77,976	54
55		35,963	2,062	5,512	28,389	0	11,137	17,252	17,252	183	78,158	55
56		35,963	2,062	5,512	28,389	0	11,137	17,252	(130,766)	(1,275)	76,883	56
Total	148,018	2,013,928	115,472	308,672	1,589,784	148,018	565,605	876,161	728,143	76,883	1,865,698	

BSG/NU COMPANY MAIN AUTHORIZATION ORDER **PRE-CONSTRUCTION IRR**

Field Loc: **LAWRENCE**
Bay State Gas Company

PROJECT ID# L2000D0022 D

Attachment ROR/MIS:	DATE: 03-27 H.P. 136(b) Page 4 of 62
Hurdle Rate:	11.50% 10.0

Work Code MNECC

DESCRIPTION OF PROJECT:

This authorization provides for the installation of 300' of 6" PE main on Clifton St. from the 8" CS main on Bowdoin St., 450' of 6" PE main on Andover St., and 1,100' of 6" PE main on Newton St. to the Wetherbee School. This will be a High Pressure (99psi) main and will allow the future installation of a regulator vault into the existing Low Pressure system.

Services 2 Total Service Cost \$ ~~42,978~~ **5961.27** Cust Contribution = \$ \$0

COST RECORD

Materials
Company Labor
Purchases
Overheads
Total

BUDGET	ACTUAL	VARIANCE
\$10,641		\$10,641
\$3,178		\$3,178
\$60,938		\$60,938
\$8,311		\$8,311
\$83,067	\$0	\$83,067

Today's Date: 12/14/2
Start Date: _____
Comp. Date: _____
Estimator: Nerden
Sales Rep: Call
CIS # 1034553

	Pipe Added Street Name and Town	Pipe		Footage		W.O. # Install	W.O. # Tie - In
		Size	Type	Estimate	Actual		
1	Clifton St. Lawrence	6	PE	300	253	4774060	4774092
2	Andover St.	6	PE	450	496	4774084	4774096
3	Newton St.	6	PE	1,100	1390	4762144	4774098
4	0 <i>Bowdoin</i>	0	PE	0	380		
5	0	0	PE	0			
6	0	0	PE	0	252		

	Pipe Retired Street Name and Town	Inst. Year	Pipe		Footage		W.O. # Replace	W.O. # Tie - In
			Size	Type	Estimate	Actual		
1								
2								
3								
4								
5								
6								

Please Sign and Date

<input type="checkbox"/>	Residential
<input checked="" type="checkbox"/>	C & I

Local Approval (Growth Projects)	Local Approval (Repl, Mun, Sys Imp)
CC Supervisor <i>[Signature]</i> 3-20-01	Engineering Manager <i>[Signature]</i>
Sales Manager <i>[Signature]</i> 2-11-01	Distribution Manager <i>[Signature]</i>
	Operations Manager <i>[Signature]</i>

<input checked="" type="checkbox"/>	Growth
<input type="checkbox"/>	Replacement
<input type="checkbox"/>	Municipal
<input checked="" type="checkbox"/>	Sys Improve

APPROVAL OVER \$25,000	
General Manager <i>[Signature]</i>	2-15-02
Director of Engineering <i>[Signature]</i>	
VP Operations <i>[Signature]</i>	
VP Strategy and Finance <i>[Signature]</i>	

ATTACHMENT RR-DTE-136 (b)

Revenue Producing Plants Additions
Account 367 (Mains) > \$50K and < \$100K

List No. 2 (on DTE-3-27 Revised)

POST CONSTRUCTION - RATE OF RETURN ESTIMATE

WORKPAPER

Project: Wrentham State School
Wrentham

Total Capital and O&M Costs

Meter Counts, Mcf Load and Net Revenue

Capital			Meter Counts	1
Mains	\$	86,165		
Services		6,898	Load (Mcf)	13,000
Meters		0		
Marginal Capital		0	Net Revenue	\$ 33,955 1st year
Total	\$	93,063		18,738 2nd Year
				8,671 3rd Year
O & M costs	\$	1,065 annual		
Property Tax Rate	\$	15.19 per thousand		

Results Summary

	15 Yrs.
* IRR	2.01%
* NPV	(\$27,000)
* Customer Contribution	\$44,429

Year	Investment	Revenue	O&M	Property Tax	Profit Before Taxes	Depreciation 20 Year Class	Income Taxes	Total Net Income	Total Net Cash Flow (\$93,063)	P.V. OF Cash Flow (\$93,063)	Payback Calculation (\$93,063)	Payback Period
1	\$93,063	\$33,955	\$1,065	\$1,414	\$31,476	\$3,490	\$10,979	\$17,007	\$20,497	18,870	(\$74,193)	1
2		18,738	1,065	1,414	16,259	6,718	3,743	5,798	12,516	10,608	(63,584)	2
3		8,671	1,065	1,414	6,192	6,214	(9)	(13)	6,201	4,838	(58,746)	3
4		8,671	1,065	1,414	6,192	5,749	174	270	6,018	4,323	(54,422)	4
5		8,671	1,065	1,414	6,192	5,317	343	532	5,849	3,868	(50,554)	5
6		8,671	1,065	1,414	6,192	4,918	500	774	5,692	3,466	(47,088)	6
7		8,671	1,065	1,414	6,192	4,549	645	999	5,547	3,116	(43,979)	7
8		8,671	1,065	1,414	6,192	4,208	778	1,205	5,414	2,794	(41,185)	8
9		8,671	1,065	1,414	6,192	4,152	800	1,239	5,392	2,562	(38,623)	9
10		8,671	1,065	1,414	6,192	4,152	800	1,240	5,392	2,358	(36,264)	10
11		8,671	1,065	1,414	6,192	4,152	800	1,239	5,392	2,171	(34,093)	11
12		8,671	1,065	1,414	6,192	4,152	800	1,240	5,392	1,999	(32,094)	12
13		8,671	1,065	1,414	6,192	4,152	800	1,239	5,392	1,840	(30,254)	13
14		8,671	1,065	1,414	6,192	4,152	800	1,240	5,392	1,694	(28,559)	14
15		8,671	1,065	1,414	6,192	4,152	800	1,239	5,392	1,560	(27,000)	15
16		8,671	1,065	1,414	6,192	4,152	800	1,240	5,392	1,436	(25,564)	16
17		8,671	1,065	1,414	6,192	4,152	800	1,239	5,392	1,322	(24,241)	17
18		8,671	1,065	1,414	6,192	4,152	800	1,240	5,392	1,217	(23,024)	18
19		8,671	1,065	1,414	6,192	4,152	800	1,239	5,392	1,121	(21,904)	19
20		8,671	1,065	1,414	6,192	4,152	800	1,240	5,392	1,032	(20,872)	20
21		8,671	1,065	1,414	6,192	2,076	1,615	2,501	4,577	806	(20,066)	21
22		8,671	1,065	1,414	6,192	0	2,429	3,763	3,763	610	(19,455)	22
23		8,671	1,065	1,414	6,192	0	2,429	3,763	3,763	562	(18,894)	23
24		8,671	1,065	1,414	6,192	0	2,429	3,763	3,763	517	(18,376)	24
25		8,671	1,065	1,414	6,192	0	2,429	3,763	3,763	476	(17,900)	25
26		8,671	1,065	1,414	6,192	0	2,429	3,763	3,763	438	(17,462)	26
27		8,671	1,065	1,414	6,192	0	2,429	3,763	3,763	404	(17,058)	27
28		8,671	1,065	1,414	6,192	0	2,429	3,763	3,763	372	(16,687)	28
29		8,671	1,065	1,414	6,192	0	2,429	3,763	3,763	342	(16,345)	29
30		8,671	1,065	1,414	6,192	0	2,429	3,763	3,763	315	(16,030)	30
31		8,671	1,065	1,414	6,192	0	2,429	3,763	3,763	290	(15,740)	31
32		8,671	1,065	1,414	6,192	0	2,429	3,763	3,763	267	(15,473)	32
33		8,671	1,065	1,414	6,192	0	2,429	3,763	3,763	246	(15,227)	33
34		8,671	1,065	1,414	6,192	0	2,429	3,763	3,763	226	(15,001)	34
35		8,671	1,065	1,414	6,192	0	2,429	3,763	3,763	208	(14,792)	35
36		8,671	1,065	1,414	6,192	0	2,429	3,763	3,763	192	(14,601)	36
37		8,671	1,065	1,414	6,192	0	2,429	3,763	3,763	177	(14,424)	37
38		8,671	1,065	1,414	6,192	0	2,429	3,763	3,763	163	(14,262)	38
39		8,671	1,065	1,414	6,192	0	2,429	3,763	3,763	150	(14,112)	39
40		8,671	1,065	1,414	6,192	0	2,429	3,763	3,763	138	(13,974)	40
41		8,671	1,065	1,414	6,192	0	2,429	3,763	3,763	127	(13,847)	41
42		8,671	1,065	1,414	6,192	0	2,429	3,763	3,763	117	(13,731)	42
43		8,671	1,065	1,414	6,192	0	2,429	3,763	3,763	107	(13,623)	43
44		8,671	1,065	1,414	6,192	0	2,429	3,763	3,763	99	(13,524)	44
45		8,671	1,065	1,414	6,192	0	2,429	3,763	3,763	91	(13,433)	45
46		8,671	1,065	1,414	6,192	0	2,429	3,763	3,763	84	(13,349)	46
47		8,671	1,065	1,414	6,192	0	2,429	3,763	3,763	77	(13,272)	47
48		8,671	1,065	1,414	6,192	0	2,429	3,763	3,763	71	(13,201)	48
49		8,671	1,065	1,414	6,192	0	2,429	3,763	3,763	65	(13,135)	49
50		8,671	1,065	1,414	6,192	0	2,429	3,763	3,763	60	(13,075)	50
51		8,671	1,065	1,414	6,192	0	2,429	3,763	3,763	55	(13,020)	51
52		8,671	1,065	1,414	6,192	0	2,429	3,763	3,763	51	(12,969)	52
53		8,671	1,065	1,414	6,192	0	2,429	3,763	3,763	47	(12,922)	53
54		8,671	1,065	1,414	6,192	0	2,429	3,763	3,763	43	(12,878)	54
55		8,671	1,065	1,414	6,192	0	2,429	3,763	3,763	40	(12,838)	55
56		8,671	1,065	1,414	6,192	0	2,429	3,763	(89,300)	(871)	(13,709)	56
Total	93,063	\$20,927	\$9,640	\$9,184	\$82,103	\$93,063	\$113,390	\$175,650	\$2,587	(13,709)	(1,407,709)	

Author: Kim Dana at CCCORP
Date: 5/1/98 9:38 AM
Priority: Normal
Receipt Requested
TO: Ed Furtado at CCBRO
Subject: Re: Wrentham State School

PRE-CONSTRUCTION
IRR

----- Message Contents -----

Ed,
During the time you were faxing me the ror, i figured out what I had used done to get the same monthly distribution. Let me know if you need anything else.
Thanks, Kim.

INTERNAL RATE OF RETURN ANALYSIS

Development Name: WRENTHAM STATE SCHOOL

Address EMERALD STREET
Town WRENTHAM
Division: Brockton Number
of Meters 1

Proposed Heat Load Mcf: 0
Proposed Base Load Mcf: 64,000
Total Load 64,000

Rate Schedule U
0

Heat/Summer Load per Meter 0
Base Load per Meter 64,000
Load Per Meter 64,000
Estimated Cost:
New Main \$117,345
Service 5,740
Meter & Fit 5,000
System Improvement 0
Marginal Costs 8,710
Project Total \$136,795
Cost per Meter \$136,795

Results (Cash Flow Basis) - 15 YEAR RETURN

Rate of return - IRR 19.06%
*Customer Contribution \$0
* NPV \$92,615
* Net Payback (years) 7
* Net Gas Revenues \$47,102
* Net Rate/MMBtu \$0.74

Reply Separator

Subject: Wrentham State School
Author: Ed Furtado at CCBRO
Date: 4/30/98 4:13 PM

Kim,

While I was reviewing this project with Ralph Gurney, he stated that the current main cost is significantly higher than that listed in the

ATTACHMENT RR-DTE-136 (b)

Revenue Producing Plants Additions
Account 367 (Mains) > \$50K and < \$100K

List No. 3 (on DTE-3-27 Revised)

POST CONSTRUCTION - RATE OF RETURN ESTIMATE

WORKPAPER

Project: Battles Street
Brockton

Total Capital and O&M Costs

Meter Counts, Mcf Load and Net Revenue

Capital			Meter Counts	2
Mains	\$	87,668	Load (Mcf)	13,604
Services		6,610		
Meters		0	Net Revenue	\$ 21,016 annual
Marginal Capital		0		
Total	\$	94,278		
O & M costs	\$	1,262 annual		
Property Tax Rate	\$	29.88 per thousand		

Results Summary

* IRR	55 Yrs.
* NPV	12.78%
* Customer Contribution	\$41,795
	\$0

Year	Investment	Revenue	O&M	Property Tax	Profit Before Taxes	Depreciation 20 Year Class	Income Taxes	Total Net Income	Total Net Cash Flow (\$94,278)	P.V. OF Cash Flow (\$94,278)	Payback Calculation (\$94,278)	Payback Period
1	\$94,278	\$21,016	\$1,262	\$2,817	\$16,937	\$3,535	\$5,257	\$8,144	\$11,680	10,753	(583,525)	1
2		21,016	1,262	2,817	16,937	6,806	3,974	6,157	12,963	10,987	(72,539)	2
3		21,016	1,262	2,817	16,937	6,295	4,175	6,467	12,762	9,958	(62,580)	3
4		21,016	1,262	2,817	16,937	5,824	4,360	6,754	12,577	9,035	(53,545)	4
5		21,016	1,262	2,817	16,937	5,386	4,531	7,019	12,406	8,205	(45,340)	5
6		21,016	1,262	2,817	16,937	4,983	4,690	7,265	12,247	7,457	(37,883)	6
7		21,016	1,262	2,817	16,937	4,608	4,837	7,492	12,100	6,783	(31,099)	7
8		21,016	1,262	2,817	16,937	4,263	4,972	7,702	11,965	6,175	(24,924)	8
9		21,016	1,262	2,817	16,937	4,207	4,994	7,736	11,943	5,674	(19,250)	9
10		21,016	1,262	2,817	16,937	4,206	4,994	7,737	11,943	5,224	(14,026)	10
11		21,016	1,262	2,817	16,937	4,207	4,994	7,736	11,943	4,810	(9,217)	11
12		21,016	1,262	2,817	16,937	4,206	4,994	7,737	11,943	4,428	(4,789)	12
13		21,016	1,262	2,817	16,937	4,207	4,994	7,736	11,943	4,076	(712)	13
14		21,016	1,262	2,817	16,937	4,206	4,994	7,737	11,943	3,753	3,640	14
15		21,016	1,262	2,817	16,937	4,207	4,994	7,736	11,943	3,455	6,496	15
16		21,016	1,262	2,817	16,937	4,206	4,994	7,737	11,943	3,181	9,676	16
17		21,016	1,262	2,817	16,937	4,207	4,994	7,736	11,943	2,928	12,605	17
18		21,016	1,262	2,817	16,937	4,206	4,994	7,737	11,943	2,696	15,301	18
19		21,016	1,262	2,817	16,937	4,207	4,994	7,736	11,943	2,482	17,783	19
20		21,016	1,262	2,817	16,937	4,206	4,994	7,737	11,943	2,285	20,068	20
21		21,016	1,262	2,817	16,937	2,103	5,819	9,014	11,118	1,958	22,027	21
22		21,016	1,262	2,817	16,937	0	6,644	10,293	10,293	1,669	23,696	22
23		21,016	1,262	2,817	16,937	0	6,644	10,293	10,293	1,537	25,232	23
24		21,016	1,262	2,817	16,937	0	6,644	10,293	10,293	1,415	26,647	24
25		21,016	1,262	2,817	16,937	0	6,644	10,293	10,293	1,303	27,950	25
26		21,016	1,262	2,817	16,937	0	6,644	10,293	10,293	1,199	29,149	26
27		21,016	1,262	2,817	16,937	0	6,644	10,293	10,293	1,104	30,253	27
28		21,016	1,262	2,817	16,937	0	6,644	10,293	10,293	1,016	31,269	28
29		21,016	1,262	2,817	16,937	0	6,644	10,293	10,293	936	32,205	29
30		21,016	1,262	2,817	16,937	0	6,644	10,293	10,293	861	33,066	30
31		21,016	1,262	2,817	16,937	0	6,644	10,293	10,293	793	33,860	31
32		21,016	1,262	2,817	16,937	0	6,644	10,293	10,293	730	34,590	32
33		21,016	1,262	2,817	16,937	0	6,644	10,293	10,293	672	35,262	33
34		21,016	1,262	2,817	16,937	0	6,644	10,293	10,293	619	35,881	34
35		21,016	1,262	2,817	16,937	0	6,644	10,293	10,293	570	36,450	35
36		21,016	1,262	2,817	16,937	0	6,644	10,293	10,293	525	36,975	36
37		21,016	1,262	2,817	16,937	0	6,644	10,293	10,293	483	37,458	37
38		21,016	1,262	2,817	16,937	0	6,644	10,293	10,293	445	37,903	38
39		21,016	1,262	2,817	16,937	0	6,644	10,293	10,293	409	38,312	39
40		21,016	1,262	2,817	16,937	0	6,644	10,293	10,293	377	38,689	40
41		21,016	1,262	2,817	16,937	0	6,644	10,293	10,293	347	39,036	41
42		21,016	1,262	2,817	16,937	0	6,644	10,293	10,293	319	39,355	42
43		21,016	1,262	2,817	16,937	0	6,644	10,293	10,293	294	39,649	43
44		21,016	1,262	2,817	16,937	0	6,644	10,293	10,293	271	39,920	44
45		21,016	1,262	2,817	16,937	0	6,644	10,293	10,293	249	40,169	45
46		21,016	1,262	2,817	16,937	0	6,644	10,293	10,293	229	40,398	46
47		21,016	1,262	2,817	16,937	0	6,644	10,293	10,293	211	40,610	47
48		21,016	1,262	2,817	16,937	0	6,644	10,293	10,293	194	40,804	48
49		21,016	1,262	2,817	16,937	0	6,644	10,293	10,293	179	40,983	49
50		21,016	1,262	2,817	16,937	0	6,644	10,293	10,293	165	41,148	50
51		21,016	1,262	2,817	16,937	0	6,644	10,293	10,293	152	41,300	51
52		21,016	1,262	2,817	16,937	0	6,644	10,293	10,293	140	41,439	52
53		21,016	1,262	2,817	16,937	0	6,644	10,293	10,293	129	41,568	53
54		21,016	1,262	2,817	16,937	0	6,644	10,293	10,293	118	41,686	54
55		21,016	1,262	2,817	16,937	0	6,644	10,293	10,293	109	41,795	55
56		21,016	1,262	2,817	16,937	0	6,644	10,293	(83,985)	(819)	40,976	56
Total	94,278	1,176,896	70,672	157,752	948,472	94,278	335,100	519,094	424,816	40,976	828,972	

PRE-CONSTRUCTION
IRR

B98 D0065

BAY STATE GAS COMPANY - MAIN ORDER

Division BROCKTON Work Code MNNCC ROR Allowance 12.45%

Description/Comments NEW MAIN

This authorization reflects the estimated cost to provide natural gas to

2 new customer(s). Brockton Schools

* City of Brockton Schools

Urban ☐ Suburban ☐ ☒ Rural ☐ Builder Policy ☐ Customer Contribution ☐ \$0

COST RECORD	BUDGET	ACTUAL	VARIANCE	Today's date:	11/13/97
MATERIAL	7,687			Start date:	8/18/98
LABOR	1,459			Comp. date:	10/7/98
CONTRACTOR	43,386			Estimator:	TMS
OVERHEAD	7,222			Sales Rep:	McCarthy
TOTAL	\$59,754			Project #	CCS # 1013364

PIPE INSTALLED: FROM: 1) #198 Battles St Fairmount St
2) Battles St Division St
3) Fairmount St TO: N. Main St
4)
5)
6)

Pipe Added		Size	Type	Footage		Work Order Number
Street Name & Town				Estimate	Actual	
1 Battles St	Brockton	4	PP	1610	1571	1089298
2 Division St	Brockton	4	PP	720	792	1089303
3 Fairmount St	Brockton	4	PP	425	400	1089312
4						
5						
6						

Pipe Retired		Size	Type	Footage		Work Order Number	Install Year
Street Name & Town				Estimate	Actual		
1							
2							
3							
4							
5							
6							

No. of Services 2
Permit Received ☐
Residential ☐
Commercial/Industrial ☒
Pressure ☐ Int

Divisional Approval
Sales Manager [Signature] 2/17/98
Engineering [Signature] 2/17/98
Distribution Manager [Signature] 2/17/98
Division Manager [Signature]

Corporate Approval
Sales Manager [Signature] 2/17/98
Engineering [Signature] 2/17/98
Operations [Signature] 2/17/98
CFO [Signature] 2/17/98
Controller [Signature] 2/17/98

ATTACHMENT RR-DTE-136 (b)

Revenue Producing Plants Additions
Account 367 (Mains) > \$50K and < \$100K

List No. 4 (on DTE-3-27 Revised)

POST CONSTRUCTION - RATE OF RETURN ESTIMATE

WORKPAPER

POST-CONSTRUCTION

Project: Turnpike Street
Canton

Total Capital and O&M Costs

Meter Counts, Mcf Load and Net Revenue

Capital			Meter Counts	2
Mains	\$	83,154		
Services		11,080	Load (Mcf)	55,783
Meters		0		
Marginal Capital		6,022	Net Revenue	\$ 73,112 annual
Total	\$	100,256		

O & M costs \$ 4,215 annual

Property Tax Rate \$ 23.65 per thousand

Results Summary

	15 Yrs.
* IRR	42.26%
* NPV	\$249,984
* Customer Contribution	\$0

Year	Investment	Revenue	O&M	Property Tax	Profit Before Taxes	Depreciation 20 Year Class	Income Taxes	Total Net Income	Total Net Cash Flow (\$100,256)	P.V. OF Cash Flow (\$100,256)	Payback Calculation (\$100,256)	Payback Period
1	\$100,256	\$73,112	\$4,215	\$2,371	\$66,526	\$3,760	\$24,623	\$38,143	\$41,903	38,577	(\$61,679)	1
2		73,112	4,215	2,371	66,526	7,237	23,259	36,030	43,267	36,672	(25,006)	2
3		73,112	4,215	2,371	66,526	6,694	23,472	36,360	43,054	33,596	8,589	3
4		73,112	4,215	2,371	66,526	6,193	23,669	36,664	42,857	30,788	39,378	4
5		73,112	4,215	2,371	66,526	5,728	23,851	36,947	42,675	28,224	67,602	5
6		73,112	4,215	2,371	66,526	5,299	24,020	37,208	42,506	25,882	93,484	6
7		73,112	4,215	2,371	66,526	4,901	24,176	37,450	42,350	23,740	117,224	7
8		73,112	4,215	2,371	66,526	4,534	24,320	37,673	42,206	21,782	139,006	8
9		73,112	4,215	2,371	66,526	4,473	24,343	37,709	42,183	20,042	159,049	9
10		73,112	4,215	2,371	66,526	4,472	24,344	37,710	42,182	18,452	177,500	10
11		73,112	4,215	2,371	66,526	4,473	24,343	37,709	42,183	16,987	194,488	11
12		73,112	4,215	2,371	66,526	4,472	24,344	37,710	42,182	15,639	210,127	12
13		73,112	4,215	2,371	66,526	4,473	24,343	37,709	42,183	14,398	224,525	13
14		73,112	4,215	2,371	66,526	4,472	24,344	37,710	42,182	13,255	237,780	14
15		73,112	4,215	2,371	66,526	4,473	24,343	37,709	42,183	12,204	249,984	15
16		73,112	4,215	2,371	66,526	4,472	24,344	37,710	42,182	11,235	261,219	16
17		73,112	4,215	2,371	66,526	4,473	24,343	37,709	42,183	10,344	271,563	17
18		73,112	4,215	2,371	66,526	4,472	24,344	37,710	42,182	9,523	281,085	18
19		73,112	4,215	2,371	66,526	4,473	24,343	37,709	42,183	8,767	289,852	19
20		73,112	4,215	2,371	66,526	4,472	24,344	37,710	42,182	8,071	297,923	20
21		73,112	4,215	2,371	66,526	2,237	25,221	39,069	41,305	7,276	305,199	21
22		73,112	4,215	2,371	66,526	0	26,098	40,428	40,428	6,556	311,756	22
23		73,112	4,215	2,371	66,526	0	26,098	40,428	40,428	6,036	317,792	23
24		73,112	4,215	2,371	66,526	0	26,098	40,428	40,428	5,557	323,349	24
25		73,112	4,215	2,371	66,526	0	26,098	40,428	40,428	5,116	328,465	25
26		73,112	4,215	2,371	66,526	0	26,098	40,428	40,428	4,710	333,175	26
27		73,112	4,215	2,371	66,526	0	26,098	40,428	40,428	4,336	337,511	27
28		73,112	4,215	2,371	66,526	0	26,098	40,428	40,428	3,992	341,503	28
29		73,112	4,215	2,371	66,526	0	26,098	40,428	40,428	3,675	345,179	29
30		73,112	4,215	2,371	66,526	0	26,098	40,428	40,428	3,384	348,562	30
31		73,112	4,215	2,371	66,526	0	26,098	40,428	40,428	3,115	351,678	31
32		73,112	4,215	2,371	66,526	0	26,098	40,428	40,428	2,868	354,545	32
33		73,112	4,215	2,371	66,526	0	26,098	40,428	40,428	2,640	357,186	33
34		73,112	4,215	2,371	66,526	0	26,098	40,428	40,428	2,431	359,617	34
35		73,112	4,215	2,371	66,526	0	26,098	40,428	40,428	2,238	361,854	35
36		73,112	4,215	2,371	66,526	0	26,098	40,428	40,428	2,060	363,915	36
37		73,112	4,215	2,371	66,526	0	26,098	40,428	40,428	1,897	365,812	37
38		73,112	4,215	2,371	66,526	0	26,098	40,428	40,428	1,746	367,558	38
39		73,112	4,215	2,371	66,526	0	26,098	40,428	40,428	1,608	369,165	39
40		73,112	4,215	2,371	66,526	0	26,098	40,428	40,428	1,480	370,646	40
41		73,112	4,215	2,371	66,526	0	26,098	40,428	40,428	1,363	372,008	41
42		73,112	4,215	2,371	66,526	0	26,098	40,428	40,428	1,254	373,263	42
43		73,112	4,215	2,371	66,526	0	26,098	40,428	40,428	1,155	374,418	43
44		73,112	4,215	2,371	66,526	0	26,098	40,428	40,428	1,063	375,481	44
45		73,112	4,215	2,371	66,526	0	26,098	40,428	40,428	979	376,460	45
46		73,112	4,215	2,371	66,526	0	26,098	40,428	40,428	901	377,361	46
47		73,112	4,215	2,371	66,526	0	26,098	40,428	40,428	830	378,191	47
48		73,112	4,215	2,371	66,526	0	26,098	40,428	40,428	764	378,955	48
49		73,112	4,215	2,371	66,526	0	26,098	40,428	40,428	703	379,658	49
50		73,112	4,215	2,371	66,526	0	26,098	40,428	40,428	647	380,305	50
51		73,112	4,215	2,371	66,526	0	26,098	40,428	40,428	596	380,901	51
52		73,112	4,215	2,371	66,526	0	26,098	40,428	40,428	549	381,450	52
53		73,112	4,215	2,371	66,526	0	26,098	40,428	40,428	505	381,955	53
54		73,112	4,215	2,371	66,526	0	26,098	40,428	40,428	465	382,420	54
55		73,112	4,215	2,371	66,526	0	26,098	40,428	40,428	428	382,849	55
56		73,112	4,215	2,371	66,526	0	26,098	40,428	40,428	(59,828)	382,265	56
Total	100,256	4,094,272	236,040	132,776	3,725,456	100,256	1,422,166	2,203,034	2,102,778	382,265	16,105,841	

BSG/NU COMPANY MAIN AUTHORIZATION ORDER

PROJECT ID#

398D 0105

Work Code

MNNCC

PRE-CONSTRUCTION
IRR

Bay State Gas Company
Field Loc: Brockton 5-27

Attachment: 136(b)

ROR/MIS: 29.9% of 62

Hurdle Rate: 8.75%

DESCRIPTION OF PROJECT: NEW MAIN

This authorization reflects the estimated cost to provide natural gas to
1 new customer(s).

Services

1

Total Service Cost

\$11,080

Cust Contribution =

\$0

COST RECORD

	BUDGET	ACTUAL	VARIANCE
Materials	17,025		
Company Labor	1,880		
Purchases	39,579		
Overheads	15,028		
Total	\$73,511		

Today's Date: 07/14/98

Start Date:

Comp. Date:

Estimator:

KAF

Sales Rep:

Furtado

CIS #

1019322

Pipe Added		Pipe		Footage		W.O. #	W.O. #
Street Name and Town		Size	Type	Estimate	Actual	Install	Tie - In
1							
2							
3							
4							
5							
6							
7	Turnpike Street						
8	Sassamon Street	6	PP	2000		12660022	12660040
9		6	PP	425		12660089	12660093

Pipe Retired		Pipe		Footage		W.O. #	W.O. #
Street Name and Town		Size	Type	Estimate	Actual	Install	Tie - In
1							
2							
3							
4							
5							
6							
7							
8							
9							

Please Sign and Date

☒ Residential
☐ C & I

Local Approval (Growth Projects) Local Approval (Repl, Mun, Sys Imp)
CC Leader *[Signature]* Engineering *[Signature]*
Sales Leader *[Signature]* Physical Leader *[Signature]*

☒ Growth
☐ Replacement
☐ Municipal
☐ Sys Improve

CORPORATE APPROVAL OVER \$25,000
Sub Process Leader *[Signature]* 7-29-98
OVER \$50,000
Corporate Engineering
Process Leader
CFO

ATTACHMENT RR-DTE-136 (b)

Revenue Producing Plants Additions
Account 367 (Mains) > \$50K and < \$100K

List No. 5 (on DTE-3-27 Revised)

POST CONSTRUCTION - RATE OF RETURN ESTIMATE

WORKPAPER

Project: The Woods
Wilbraham

Total Capital and O&M Costs

Capital		
Mains	\$	92,230
Services		67,348
Meters		0
Marginal Capital		1,281
Total	\$	160,859

Meter Counts, Mcf Load and Net Revenue

Meter Counts	145
Load (Mcf)	15,080
Net Revenue	\$ 57,623 annual

O & M costs \$ 23,531 annual

Property Tax Rate \$ 17.00 per thousand

Results Summary	
55 Yrs.	
* IRR	13.75%
* NPV	\$88,463
* Customer Contribution	\$0

Year	Investment	Revenue	O&M	Property Tax	Profit Before Taxes	Depreciation 20 Year Class	Income Taxes	Total Net Income	Total Net Cash Flow (\$160,859)	P.V. OF Cash Flow (\$160,859)	Payback Calculation (\$160,859)	Payback Period
1	\$160,859	\$57,623	\$23,531	\$2,735	\$31,357	\$6,032	\$9,935	\$15,390	\$21,422	19,722	(\$141,137)	1
2		\$57,623	\$23,531	\$2,735	\$31,357	\$6,112	7,746	11,999	23,611	20,012	(121,125)	2
3		\$57,623	\$23,531	\$2,735	\$31,357	\$6,192	8,088	12,529	23,269	18,157	(102,967)	3
4		\$57,623	\$23,531	\$2,735	\$31,357	\$6,272	8,403	13,017	22,954	16,490	(86,478)	4
5		\$57,623	\$23,531	\$2,735	\$31,357	\$6,352	8,696	13,471	22,661	14,987	(71,490)	5
6		\$57,623	\$23,531	\$2,735	\$31,357	\$6,432	8,966	13,889	22,391	13,634	(57,857)	6
7		\$57,623	\$23,531	\$2,735	\$31,357	\$6,512	9,217	14,277	22,140	12,411	(45,445)	7
8		\$57,623	\$23,531	\$2,735	\$31,357	\$6,592	9,448	14,635	21,909	11,307	(34,138)	8
9		\$57,623	\$23,531	\$2,735	\$31,357	\$6,672	9,486	14,694	21,871	10,392	(23,747)	9
10		\$57,623	\$23,531	\$2,735	\$31,357	\$6,752	9,486	14,695	21,871	9,567	(14,180)	10
11		\$57,623	\$23,531	\$2,735	\$31,357	\$6,832	9,486	14,694	21,871	8,808	(5,372)	11
12		\$57,623	\$23,531	\$2,735	\$31,357	\$6,912	9,486	14,695	21,871	8,109	2,737	12
13		\$57,623	\$23,531	\$2,735	\$31,357	\$6,992	9,486	14,694	21,871	7,465	10,202	13
14		\$57,623	\$23,531	\$2,735	\$31,357	\$7,072	9,486	14,695	21,871	6,873	17,075	14
15		\$57,623	\$23,531	\$2,735	\$31,357	\$7,152	9,486	14,694	21,871	6,327	23,402	15
16		\$57,623	\$23,531	\$2,735	\$31,357	\$7,232	9,486	14,695	21,871	5,825	29,227	16
17		\$57,623	\$23,531	\$2,735	\$31,357	\$7,312	9,486	14,694	21,871	5,363	34,590	17
18		\$57,623	\$23,531	\$2,735	\$31,357	\$7,392	9,486	14,695	21,871	4,937	39,528	18
19		\$57,623	\$23,531	\$2,735	\$31,357	\$7,472	9,486	14,694	21,871	4,546	44,073	19
20		\$57,623	\$23,531	\$2,735	\$31,357	\$7,552	9,486	14,695	21,871	4,185	48,258	20
21		\$57,623	\$23,531	\$2,735	\$31,357	\$7,632	10,893	16,875	20,464	3,605	51,863	21
22		\$57,623	\$23,531	\$2,735	\$31,357	\$7,712	12,301	19,056	19,056	3,090	54,953	22
23		\$57,623	\$23,531	\$2,735	\$31,357	\$7,792	12,301	19,056	19,056	2,845	57,798	23
24		\$57,623	\$23,531	\$2,735	\$31,357	\$7,872	12,301	19,056	19,056	2,619	60,417	24
25		\$57,623	\$23,531	\$2,735	\$31,357	\$7,952	12,301	19,056	19,056	2,411	62,829	25
26		\$57,623	\$23,531	\$2,735	\$31,357	\$8,032	12,301	19,056	19,056	2,220	65,049	26
27		\$57,623	\$23,531	\$2,735	\$31,357	\$8,112	12,301	19,056	19,056	2,044	67,093	27
28		\$57,623	\$23,531	\$2,735	\$31,357	\$8,192	12,301	19,056	19,056	1,882	68,975	28
29		\$57,623	\$23,531	\$2,735	\$31,357	\$8,272	12,301	19,056	19,056	1,732	70,707	29
30		\$57,623	\$23,531	\$2,735	\$31,357	\$8,352	12,301	19,056	19,056	1,595	72,302	30
31		\$57,623	\$23,531	\$2,735	\$31,357	\$8,432	12,301	19,056	19,056	1,468	73,770	31
32		\$57,623	\$23,531	\$2,735	\$31,357	\$8,512	12,301	19,056	19,056	1,352	75,122	32
33		\$57,623	\$23,531	\$2,735	\$31,357	\$8,592	12,301	19,056	19,056	1,245	76,366	33
34		\$57,623	\$23,531	\$2,735	\$31,357	\$8,672	12,301	19,056	19,056	1,146	77,512	34
35		\$57,623	\$23,531	\$2,735	\$31,357	\$8,752	12,301	19,056	19,056	1,055	78,567	35
36		\$57,623	\$23,531	\$2,735	\$31,357	\$8,832	12,301	19,056	19,056	971	79,538	36
37		\$57,623	\$23,531	\$2,735	\$31,357	\$8,912	12,301	19,056	19,056	894	80,432	37
38		\$57,623	\$23,531	\$2,735	\$31,357	\$8,992	12,301	19,056	19,056	823	81,255	38
39		\$57,623	\$23,531	\$2,735	\$31,357	\$9,072	12,301	19,056	19,056	758	82,013	39
40		\$57,623	\$23,531	\$2,735	\$31,357	\$9,152	12,301	19,056	19,056	698	82,711	40
41		\$57,623	\$23,531	\$2,735	\$31,357	\$9,232	12,301	19,056	19,056	642	83,353	41
42		\$57,623	\$23,531	\$2,735	\$31,357	\$9,312	12,301	19,056	19,056	591	83,944	42
43		\$57,623	\$23,531	\$2,735	\$31,357	\$9,392	12,301	19,056	19,056	544	84,489	43
44		\$57,623	\$23,531	\$2,735	\$31,357	\$9,472	12,301	19,056	19,056	501	84,990	44
45		\$57,623	\$23,531	\$2,735	\$31,357	\$9,552	12,301	19,056	19,056	461	85,451	45
46		\$57,623	\$23,531	\$2,735	\$31,357	\$9,632	12,301	19,056	19,056	425	85,876	46
47		\$57,623	\$23,531	\$2,735	\$31,357	\$9,712	12,301	19,056	19,056	391	86,267	47
48		\$57,623	\$23,531	\$2,735	\$31,357	\$9,792	12,301	19,056	19,056	360	86,627	48
49		\$57,623	\$23,531	\$2,735	\$31,357	\$9,872	12,301	19,056	19,056	331	86,959	49
50		\$57,623	\$23,531	\$2,735	\$31,357	\$9,952	12,301	19,056	19,056	305	87,264	50
51		\$57,623	\$23,531	\$2,735	\$31,357	\$10,032	12,301	19,056	19,056	281	87,545	51
52		\$57,623	\$23,531	\$2,735	\$31,357	\$10,112	12,301	19,056	19,056	259	87,803	52
53		\$57,623	\$23,531	\$2,735	\$31,357	\$10,192	12,301	19,056	19,056	238	88,041	53
54		\$57,623	\$23,531	\$2,735	\$31,357	\$10,272	12,301	19,056	19,056	219	88,261	54
55		\$57,623	\$23,531	\$2,735	\$31,357	\$10,352	12,301	19,056	19,056	202	88,463	55
56		\$57,623	\$23,531	\$2,735	\$31,357	\$10,432	12,301	19,056	(141,803)	(1,383)	87,080	56
Total	160,859	3,226,888	1,317,736	153,160	1,755,992	160,859	625,771	969,362	808,503	87,080	2,185,980	

RESIDENTIAL RATE OF RETURN ANALYSIS

Day State Gas Company
DTE 05-27
Attachment RR DTE 136(b)
Page 16 of 62
IRR CONSTRUCTION

Date: 06/24/98
Project #: 1016705
Development Name: The Woods at Wilbraham C
Address: 2 Main Street
Town: Wilbraham
Division: Springfield
Sales Rep: Errante
Prep. By: Rad

Results (Cash Flow Basis)

Rate of Return IRR: 14.01%
Customer Contribution: \$ 0
* Net Payback (years): 12
* Net Gas Revenues: \$ 61,797
* Net Rate/MMBtu: \$ 4.24

Residential:	Load 1	Load 2	Estimated Cost:	Load 1	Load 2	Total
Number of Meters:	140	0	New Main			74,272
Heat Load Mcf:	11,200	0	Service	63,288	0	63,288
Base Load Mcf:	3,360	0	Meter & Fit	16,240	0	16,240
Total Load	14,560	0	Marginal Costs			10,458
Rate Schedule	N		Project Total	\$ 79,528	0	164,259
Heat Load per Meter	80	0	Cost per Meter	116	0	
Base Load per Meter	24	0	Cost per Service	452	0	
Load Per Meter	104	0	Cost per Foot			7

MENU

Results (Income Basis)

	Year 1	Year 2	Year 3	Year 4
Net Gas Revenues	\$ 22,070	44,141	61,797	61,797
O&M	8,127	16,254	22,756	22,756
Depreciation	2,193	4,993	6,084	6,570
Property Taxes	1,810	2,311	2,712	2,712
Operating Income	\$ 9,940	20,583	30,246	29,760
Interest Expense	3,871	4,942	5,798	5,798
Income Taxes	2,381	6,136	9,591	9,400
Net Income	\$ 3,688	9,505	14,857	14,562

ATTACHMENT RR-DTE-136 (b)

Revenue Producing Plants Additions
Account 367 (Mains) > \$50K and < \$100K

List No. 6 (on DTE-3-27 Revised)

POST CONSTRUCTION - RATE OF RETURN ESTIMATE

WORKPAPER

POST-CONSTRUCTION

Project: Bethany Road
Monson

Total Capital and O&M Costs

Meter Counts, Mcf Load and Net Revenue

Capital			Meter Counts	1
Mains	\$	67,167		
Services		800	Load (Mcf)	26,205
Meters		0		
Marginal Capital		2,227	Net Revenue	\$ 28,061 annual
Total	\$	70,194		
O & M costs	\$	1,989 annual		
Property Tax Rate	\$	15.63 per thousand		

Results Summary

15 Yrs.

* IRR	22.65%
* NPV	\$66,848
* Customer Contribution	\$0

Year	Investment	Revenue	O&M	Property Tax	Profit Before Taxes	Depreciation 20 Year Class	Income Taxes	Total Net Income	Total Net Cash Flow (\$70,194)	P.V. OF Cash Flow (\$70,194)	Payback Calculation (\$70,194)	Payback Period
1	\$70,194	\$28,061	\$1,989	\$1,085	\$24,987	\$2,632	\$8,770	\$13,585	\$16,217	14,930	(\$55,264)	1
2		28,061	1,989	1,085	24,987	5,067	7,814	12,105	12,105	14,555	(40,709)	2
3		28,061	1,989	1,085	24,987	4,687	7,964	12,336	17,023	13,284	(27,423)	3
4		28,061	1,989	1,085	24,987	4,336	8,101	12,550	16,886	12,130	(15,295)	4
5		28,061	1,989	1,085	24,987	4,010	8,229	12,748	16,758	11,083	(4,211)	5
6		28,061	1,989	1,085	24,987	3,710	8,347	12,930	16,640	10,132	5,920	6
7		28,061	1,989	1,085	24,987	3,431	8,456	13,100	16,531	9,267	15,187	7
8		28,061	1,989	1,085	24,987	3,174	8,557	13,256	16,430	8,479	23,666	8
9		28,061	1,989	1,085	24,987	3,132	8,574	13,281	16,413	7,798	31,465	9
10		28,061	1,989	1,085	24,987	3,131	8,574	13,282	16,413	7,179	38,644	10
11		28,061	1,989	1,085	24,987	3,132	8,574	13,281	16,413	6,610	45,254	11
12		28,061	1,989	1,085	24,987	3,131	8,574	13,282	16,413	6,085	51,339	12
13		28,061	1,989	1,085	24,987	3,132	8,574	13,281	16,413	5,602	56,941	13
14		28,061	1,989	1,085	24,987	3,131	8,574	13,282	16,413	5,158	62,099	14
15		28,061	1,989	1,085	24,987	3,132	8,574	13,281	16,413	4,748	66,848	15
16		28,061	1,989	1,085	24,987	3,131	8,574	13,282	16,413	4,372	71,219	16
17		28,061	1,989	1,085	24,987	3,132	8,574	13,281	16,413	4,025	75,244	17
18		28,061	1,989	1,085	24,987	3,131	8,574	13,282	16,413	3,705	78,949	18
19		28,061	1,989	1,085	24,987	3,132	8,574	13,281	16,413	3,411	82,360	19
20		28,061	1,989	1,085	24,987	3,131	8,574	13,282	16,413	3,140	85,501	20
21		28,061	1,989	1,085	24,987	1,566	9,188	14,233	15,799	2,783	88,284	21
22		28,061	1,989	1,085	24,987	0	9,802	15,185	15,185	2,463	90,746	22
23		28,061	1,989	1,085	24,987	0	9,802	15,185	15,185	2,267	93,013	23
24		28,061	1,989	1,085	24,987	0	9,802	15,185	15,185	2,087	95,101	24
25		28,061	1,989	1,085	24,987	0	9,802	15,185	15,185	1,922	97,022	25
26		28,061	1,989	1,085	24,987	0	9,802	15,185	15,185	1,769	98,791	26
27		28,061	1,989	1,085	24,987	0	9,802	15,185	15,185	1,629	100,420	27
28		28,061	1,989	1,085	24,987	0	9,802	15,185	15,185	1,499	101,919	28
29		28,061	1,989	1,085	24,987	0	9,802	15,185	15,185	1,380	103,300	29
30		28,061	1,989	1,085	24,987	0	9,802	15,185	15,185	1,271	104,571	30
31		28,061	1,989	1,085	24,987	0	9,802	15,185	15,185	1,170	105,741	31
32		28,061	1,989	1,085	24,987	0	9,802	15,185	15,185	1,077	106,818	32
33		28,061	1,989	1,085	24,987	0	9,802	15,185	15,185	992	107,810	33
34		28,061	1,989	1,085	24,987	0	9,802	15,185	15,185	913	108,723	34
35		28,061	1,989	1,085	24,987	0	9,802	15,185	15,185	841	109,563	35
36		28,061	1,989	1,085	24,987	0	9,802	15,185	15,185	774	110,337	36
37		28,061	1,989	1,085	24,987	0	9,802	15,185	15,185	712	111,049	37
38		28,061	1,989	1,085	24,987	0	9,802	15,185	15,185	656	111,705	38
39		28,061	1,989	1,085	24,987	0	9,802	15,185	15,185	604	112,309	39
40		28,061	1,989	1,085	24,987	0	9,802	15,185	15,185	556	112,865	40
41		28,061	1,989	1,085	24,987	0	9,802	15,185	15,185	512	113,377	41
42		28,061	1,989	1,085	24,987	0	9,802	15,185	15,185	471	113,848	42
43		28,061	1,989	1,085	24,987	0	9,802	15,185	15,185	434	114,282	43
44		28,061	1,989	1,085	24,987	0	9,802	15,185	15,185	399	114,681	44
45		28,061	1,989	1,085	24,987	0	9,802	15,185	15,185	368	115,049	45
46		28,061	1,989	1,085	24,987	0	9,802	15,185	15,185	338	115,387	46
47		28,061	1,989	1,085	24,987	0	9,802	15,185	15,185	312	115,699	47
48		28,061	1,989	1,085	24,987	0	9,802	15,185	15,185	287	115,986	48
49		28,061	1,989	1,085	24,987	0	9,802	15,185	15,185	264	116,250	49
50		28,061	1,989	1,085	24,987	0	9,802	15,185	15,185	243	116,493	50
51		28,061	1,989	1,085	24,987	0	9,802	15,185	15,185	224	116,717	51
52		28,061	1,989	1,085	24,987	0	9,802	15,185	15,185	206	116,923	52
53		28,061	1,989	1,085	24,987	0	9,802	15,185	15,185	190	117,113	53
54		28,061	1,989	1,085	24,987	0	9,802	15,185	15,185	175	117,288	54
55		28,061	1,989	1,085	24,987	0	9,802	15,185	15,185	161	117,448	55
56		28,061	1,989	1,085	24,987	0	9,802	15,185	(55,009)	(536)	116,912	56
Total	70,194	1,571,416	111,384	60,760	1,399,272	70,194	\$21,297	807,681	737,487	116,912	4,501,079	

Date: 09-Sep-98

Commercial ROR Model

C&I RATE OF RETURN ANALYSIS

Development Name: LAMCOTEK/NORTHEAST

Address: BETHANY RD

Town: MONSON MA

Division: Springfield

Number of Meters: 2

Proposed Heat Load Mcf: 3,648

Proposed Base Load Mcf: 21,942

Total Load: 25,590

Rate Schedule	U		T

Heat/Summer Load per Met	1,824
Base Load per Meter	10,971
Load Per Meter	12,795
Estimated Cost:	
New Main	\$53,983
Service	18,000
Meter & Fit	7,539
System Improvement	0
Marginal Costs	5,407
Project Total	\$84,929
Cost per Meter	\$42,465

Results (Cash Flow Basis) - 15 YEAR RETURN

Rate of return - IRR	23.58%
*Customer Contribution	\$0
*NPV	\$85,523
*Net Payback (Years)	6
*Net Gas Revenues	\$36,791
*Net Rate/MMBtu	\$1.44

Results (Income Basis)

	Year 1	Year 2	Year 3	Year 4
Net Gas Revenue	\$36,791	\$36,791	\$36,791	\$36,791
O&M	4,070	4,070	4,070	4,070
Depreciation	1,699	3,397	3,397	3,397
Property Taxes	1,299	1,299	1,299	1,299
Operating Income	28,723	28,025	28,025	28,025
Interest Expense	2,998	2,998	2,998	2,998
Income Taxes	10,484	9,818	9,818	9,818
Net Income	\$16,241	\$15,209	\$15,209	\$15,209
Levelized 15 yrs.				\$15,782
Net Inc. / Mcf				\$0.6167

Results (Cash Flow Basis) - 5 YEAR RETURN

Dual Fuel Required Return	7.60%
Rate of return - IRR	\$0
*Customer Contribution	\$0
*NPV	\$32,124
*Net Payback (Year)	6
*Net Gas Revenues	\$36,791
*Net Rate/MMBtu	\$1.44

PRE-CONSTRUCTION
IRR

AUTHORIZATION REQUEST

To: Please sign and forward to next person on list:

**PRE-CONSTRUCTION
IRR**

M. Poulin *MP*

~~P. LaShoto~~

~~C. Collins~~

~~T. Sherman~~

P. Giguere

From: Paul Giguere *PRG*

Date: September 15, 1998

Subject: **AUTHORIZATION REQUEST** - Bethany Road, Monson.

Attached for your approval is the authorization and rate of return for a main extension to Bethany Road, Monson Ma. The main extension is to provide gas to one industrial and one commercial account. The main extension consists of 2,250' of 4" pipe at an estimated cost of \$53,983. The rate of return is 23.5%.

The industrial account is Lamcotec. Founded in 1986, the company engineers and produces a wide range of flexible barrier fabrics that their customers use to manufacture such items as inflatable life vests, potable water containers, marine gear, inflatable boats, to name a few. The gas load is primarily a process load (20,000mcf) and a small amount of space heating (2,000 mcf). Presently propane is being used.

The commercial account is Northeast Warehousing. A warehousing operation currently utilizing two shifts. They have been in business for almost five years. They are planning a 37,000 sq. ft. expansion within the next two years. The anticipated load is 1,650 mcf of heating replacing oil, and 1,950 mcf of base load replacing propane.

If you need any more information or have any questions please call me at extension 2150.
Thanks.

ATTACHMENT RR-DTE-136 (b)

Revenue Producing Plants Additions
Account 367 (Mains) > \$50K and < \$100K

List No. 7 (on DTE-3-27 Revised)

POST CONSTRUCTION - RATE OF RETURN ESTIMATE

WORKPAPER

POST-CONSTRUCTION

Project: Archibald - Chestnut Hills
Methuen

Total Capital and O&M Costs

Meter Counts, Mcf Load and Net Revenue

Capital			Meter Counts	115
Mains	\$	76,808		
Services		93,725	Load (Mcf)	17,365
Meters		0		
Marginal Capital		7,096	Net Revenue	\$ 55,914 annual
Total	\$	177,629		

O & M costs \$ 19,041 annual

Property Tax Rate \$ 22.24 per thousand

Results Summary	
55 Yrs.	
* IRR	13.14%
* NPV	\$85,806
* Customer Contribution	\$0

Year	Investment	Revenue	O&M	Property Tax	Profit Before Taxes	Depreciation 20 Year Class	Income Taxes	Total Net Income	Total Net Cash Flow (\$177,629)	P.V. OF Cash Flow (\$177,629)	Payback Calculation (\$177,629)	Payback Period
1	\$177,629	\$55,914	\$19,041	\$3,950	\$32,923	\$6,661	\$10,303	\$15,959	\$22,620	20,825	(\$156,804)	1
2		\$55,914	19,041	3,950	32,923	12,823	7,885	12,215	25,038	21,222	(135,582)	2
3		\$55,914	19,041	3,950	32,923	11,860	8,263	12,800	24,660	19,243	(116,340)	3
4		\$55,914	19,041	3,950	32,923	10,972	8,611	13,340	24,312	17,465	(98,874)	4
5		\$55,914	19,041	3,950	32,923	10,148	8,935	13,840	23,988	15,865	(83,009)	5
6		\$55,914	19,041	3,950	32,923	9,388	9,233	14,302	23,690	14,425	(68,584)	6
7		\$55,914	19,041	3,950	32,923	8,683	9,510	14,731	23,413	13,125	(55,459)	7
8		\$55,914	19,041	3,950	32,923	8,032	9,765	15,126	23,158	11,952	(43,507)	8
9		\$55,914	19,041	3,950	32,923	7,926	9,806	15,191	23,117	10,983	(32,524)	9
10		\$55,914	19,041	3,950	32,923	7,924	9,807	15,192	23,116	10,111	(22,413)	10
11		\$55,914	19,041	3,950	32,923	7,926	9,806	15,191	23,117	9,309	(13,103)	11
12		\$55,914	19,041	3,950	32,923	7,924	9,807	15,192	23,116	8,570	(4,533)	12
13		\$55,914	19,041	3,950	32,923	7,926	9,806	15,191	23,117	7,890	3,357	13
14		\$55,914	19,041	3,950	32,923	7,924	9,807	15,192	23,116	7,264	10,621	14
15		\$55,914	19,041	3,950	32,923	7,926	9,806	15,191	23,117	6,688	17,309	15
16		\$55,914	19,041	3,950	32,923	7,924	9,807	15,192	23,116	6,157	23,466	16
17		\$55,914	19,041	3,950	32,923	7,926	9,806	15,191	23,117	5,668	29,134	17
18		\$55,914	19,041	3,950	32,923	7,924	9,807	15,192	23,116	5,218	34,352	18
19		\$55,914	19,041	3,950	32,923	7,926	9,806	15,191	23,117	4,804	39,157	19
20		\$55,914	19,041	3,950	32,923	7,924	9,807	15,192	23,116	4,423	43,580	20
21		\$55,914	19,041	3,950	32,923	3,963	11,361	17,599	21,562	3,798	47,378	21
22		\$55,914	19,041	3,950	32,923	0	12,916	20,007	20,007	3,245	50,623	22
23		\$55,914	19,041	3,950	32,923	0	12,916	20,007	20,007	2,987	53,610	23
24		\$55,914	19,041	3,950	32,923	0	12,916	20,007	20,007	2,750	56,360	24
25		\$55,914	19,041	3,950	32,923	0	12,916	20,007	20,007	2,532	58,892	25
26		\$55,914	19,041	3,950	32,923	0	12,916	20,007	20,007	2,331	61,223	26
27		\$55,914	19,041	3,950	32,923	0	12,916	20,007	20,007	2,146	63,369	27
28		\$55,914	19,041	3,950	32,923	0	12,916	20,007	20,007	1,976	65,345	28
29		\$55,914	19,041	3,950	32,923	0	12,916	20,007	20,007	1,819	67,163	29
30		\$55,914	19,041	3,950	32,923	0	12,916	20,007	20,007	1,675	68,838	30
31		\$55,914	19,041	3,950	32,923	0	12,916	20,007	20,007	1,542	70,380	31
32		\$55,914	19,041	3,950	32,923	0	12,916	20,007	20,007	1,419	71,799	32
33		\$55,914	19,041	3,950	32,923	0	12,916	20,007	20,007	1,307	73,106	33
34		\$55,914	19,041	3,950	32,923	0	12,916	20,007	20,007	1,203	74,309	34
35		\$55,914	19,041	3,950	32,923	0	12,916	20,007	20,007	1,108	75,416	35
36		\$55,914	19,041	3,950	32,923	0	12,916	20,007	20,007	1,020	76,436	36
37		\$55,914	19,041	3,950	32,923	0	12,916	20,007	20,007	939	77,374	37
38		\$55,914	19,041	3,950	32,923	0	12,916	20,007	20,007	864	78,239	38
39		\$55,914	19,041	3,950	32,923	0	12,916	20,007	20,007	796	79,034	39
40		\$55,914	19,041	3,950	32,923	0	12,916	20,007	20,007	732	79,767	40
41		\$55,914	19,041	3,950	32,923	0	12,916	20,007	20,007	674	80,441	41
42		\$55,914	19,041	3,950	32,923	0	12,916	20,007	20,007	621	81,062	42
43		\$55,914	19,041	3,950	32,923	0	12,916	20,007	20,007	572	81,633	43
44		\$55,914	19,041	3,950	32,923	0	12,916	20,007	20,007	526	82,160	44
45		\$55,914	19,041	3,950	32,923	0	12,916	20,007	20,007	484	82,644	45
46		\$55,914	19,041	3,950	32,923	0	12,916	20,007	20,007	446	83,090	46
47		\$55,914	19,041	3,950	32,923	0	12,916	20,007	20,007	411	83,501	47
48		\$55,914	19,041	3,950	32,923	0	12,916	20,007	20,007	378	83,879	48
49		\$55,914	19,041	3,950	32,923	0	12,916	20,007	20,007	348	84,227	49
50		\$55,914	19,041	3,950	32,923	0	12,916	20,007	20,007	320	84,547	50
51		\$55,914	19,041	3,950	32,923	0	12,916	20,007	20,007	295	84,842	51
52		\$55,914	19,041	3,950	32,923	0	12,916	20,007	20,007	272	85,114	52
53		\$55,914	19,041	3,950	32,923	0	12,916	20,007	20,007	250	85,364	53
54		\$55,914	19,041	3,950	32,923	0	12,916	20,007	20,007	230	85,594	54
55		\$55,914	19,041	3,950	32,923	0	12,916	20,007	20,007	212	85,806	55
56		\$55,914	19,041	3,950	32,923	0	12,916	20,007	(157,622)	(1,537)	84,269	56
Total	177,629	3,131,184	1,066,296	221,200	1,843,688	177,629	653,595	1,012,464	834,835	84,269	1,879,446	

PRE-CONSTRUCTION IRR

Residential ROR Model	
Project Name:	CHESTNUT HILLS
Project Location:	ARCHIBALD ST
Town:	METHUEN

Bay State Gas Company	
Div. Code	Print
BRK = 1	1A Summary
SPR = 2	1B Detail
LAW = 3	

B/Even =	0
----------	---

SECTION A: INPUT in BOLD

[1] Load Data	Year 1	Year 2	Year 3	Year 4
* Customer Code [2]	1	1	1	1
* Heat Load - Mcf/Meter	120	120	120	120
* Base Load - Mcf/Meter	31	31	31	31
* Meters	30	30	25	25
* Division Code	3			
* Property Tax [3]	\$20.69			
* Heat Load - Mcf/Meter	0	0	0	0
* Base Load - Mcf/Meter	0	0	0	0
* Meters	0	0	0	0

[2] Cost Data					Total
Investment - Mains \$	\$44,622	\$11,345	\$9,417	\$13,266	78,650
- Services \$	21,000	21,000	17,500	17,500	77,000
- Meters \$	3,450	3,450	2,875	2,875	12,650
- Marginal [Calc]	4,697	2,434	2,026	2,288	11,444
* Total Investment \$	73,769	38,229	31,818	35,929	179,744
* Cumulative Investment	73,769	111,998	143,816	179,744	179,744

Summary Data

	25 Yrs.	15 Yrs.	10 Yrs.	8 Yrs.
* IRR	12.176%	9.270%	3.213%	-2.697%
* NPV	\$47,115.37	\$4,903.53	(\$35,140.61)	(\$56,603.59)
* Customer Contribution	\$0	\$0	\$35,141	\$56,604
* Net Payback (yrs)	15	Net Revenues		\$55,359.00
* Discount rate	8.75%	* Net Rate/MMBtu		\$3.33
* Book Deprec. Rate	4.00%	* Income Tax Rate		39.23%
Cost of Capital	Cost Rate	Capital %	Wght. Cost Rat	Pre-Tax
Long-Term Debt	7.84%	45.00%	2.14%	3.53%
Preferred Stock	0.00%	0.00%	0.00%	0.00%
Equity	12.01%	55.00%	6.61%	6.61%
Total			8.75%	10.14%

[1] Shaded areas are calculated, no input is needed.

[2] To View Customer/Division Code schedule Go To:

[3] To View Property Tax schedule Go To:

CODE

PROPTAX

AUTHORIZATION REQUEST

**PRE-CONSTRUCTION
IRR**

To: *Please sign and forward to next name on list*

Marty Poulin ✓

Carol Collins ✓

Tom Sherman

Patty Dyer ✓

From: *Patty Dyer*

Date: *June 3, 1997*

Subject: *Chestnut Hills Authorization*

Attached is the authorization for the installation of natural gas to Chestnut Hills subdivision in Methuen, MA. The project consists of 110, 2500 square foot homes. The builder, Premier Homes, has projected a four year phasing, given the level of new home sales in Methuen and the surrounding area. This phasing is consistent with past projects he has completed with Bay State Gas. During the 1996-1997 season, 41 homes were built by Premier Homes in Dracut, and during the 1995-1996 season, 35 homes were built in another project in Methuen. The builder has already built and sold four of the homes that we serviced from the existing natural gas main, and four other homes are under contract.

Our construction costs are also phased over a four year period. The total cost under builder dig policy, is \$78,650. \$44,622 will be incurred in year 1.

Based on the size of the homes and the usage history from other new construction developments with homes of this size, an MCF of 151 per home is being used. The rate of return is 12.176%.

Premier Homes is also willing to trench the services when at all possible. The road within the development is currently being installed, and natural gas main will need to be installed in approximately three weeks.

ATTACHMENT RR-DTE-136 (b)

Revenue Producing Plants Additions
Account 367 (Mains) > \$50K and < \$100K

List No. 8 (on DTE-3-27 Revised)

POST CONSTRUCTION - RATE OF RETURN ESTIMATE

WORKPAPER

POST-CONSTRUCTION

Project: Campbell Street
North Andover

Total Capital and O&M Costs

Capital	
Mains	\$ 102,467
Services	3,383
Meters	0
Marginal Capital	0
Total	\$ 105,850

Meter Counts, Mcf Load and Net Revenue

Meter Counts	31
Load (Mcf)	3,224
Net Revenue	\$ 12,254 annual

O & M costs \$ 5,031 annual

Property Tax Rate \$ 16.35 per thousand

Results Summary	
55 Yrs.	
* IRR	3.79%
* NPV	(\$47,407)
* Customer Contribution	\$78,010

Year	Investment	Revenue	O&M	Property Tax	Profit Before Taxes	Depreciation 20 Year Class	Income Taxes	Total Net Income	Total Net Cash Flow (\$105,850)	P.V. OF Cash Flow (\$105,850)	Payback Calculation (\$101,344)	Payback Period
1	\$105,850	\$12,254	\$5,031	\$1,731	\$5,492	\$3,969	\$597	\$925	\$4,895	4,506	(\$101,344)	1
2		12,254	5,031	1,731	5,492	7,641	(843)	(1,306)	6,335	5,370	(95,974)	2
3		12,254	5,031	1,731	5,492	7,068	(618)	(957)	6,110	4,768	(91,206)	3
4		12,254	5,031	1,731	5,492	6,538	(410)	(636)	5,902	4,240	(86,966)	4
5		12,254	5,031	1,731	5,492	6,047	(218)	(337)	5,710	3,776	(83,190)	5
6		12,254	5,031	1,731	5,492	5,594	(40)	(62)	5,532	3,368	(79,821)	6
7		12,254	5,031	1,731	5,492	5,174	125	193	5,367	3,009	(76,813)	7
8		12,254	5,031	1,731	5,492	4,787	277	429	5,215	2,692	(74,121)	8
9		12,254	5,031	1,731	5,492	4,723	302	467	5,190	2,466	(71,655)	9
10		12,254	5,031	1,731	5,492	4,722	302	468	5,190	2,270	(69,385)	10
11		12,254	5,031	1,731	5,492	4,723	302	467	5,190	2,090	(67,295)	11
12		12,254	5,031	1,731	5,492	4,722	302	468	5,190	1,924	(65,370)	12
13		12,254	5,031	1,731	5,492	4,723	302	467	5,190	1,772	(63,599)	13
14		12,254	5,031	1,731	5,492	4,722	302	468	5,190	1,631	(61,968)	14
15		12,254	5,031	1,731	5,492	4,723	302	467	5,190	1,502	(60,466)	15
16		12,254	5,031	1,731	5,492	4,722	302	468	5,190	1,382	(59,084)	16
17		12,254	5,031	1,731	5,492	4,723	302	467	5,190	1,273	(57,811)	17
18		12,254	5,031	1,731	5,492	4,722	302	468	5,190	1,172	(56,640)	18
19		12,254	5,031	1,731	5,492	4,723	302	467	5,190	1,079	(55,561)	19
20		12,254	5,031	1,731	5,492	4,722	302	468	5,190	993	(54,568)	20
21		12,254	5,031	1,731	5,492	2,362	1,228	1,902	4,264	751	(53,817)	21
22		12,254	5,031	1,731	5,492	0	2,155	3,337	3,337	541	(53,276)	22
23		12,254	5,031	1,731	5,492	0	2,155	3,337	3,337	498	(52,777)	23
24		12,254	5,031	1,731	5,492	0	2,155	3,337	3,337	459	(52,319)	24
25		12,254	5,031	1,731	5,492	0	2,155	3,337	3,337	422	(51,896)	25
26		12,254	5,031	1,731	5,492	0	2,155	3,337	3,337	389	(51,507)	26
27		12,254	5,031	1,731	5,492	0	2,155	3,337	3,337	358	(51,149)	27
28		12,254	5,031	1,731	5,492	0	2,155	3,337	3,337	330	(50,820)	28
29		12,254	5,031	1,731	5,492	0	2,155	3,337	3,337	303	(50,516)	29
30		12,254	5,031	1,731	5,492	0	2,155	3,337	3,337	279	(50,237)	30
31		12,254	5,031	1,731	5,492	0	2,155	3,337	3,337	257	(49,980)	31
32		12,254	5,031	1,731	5,492	0	2,155	3,337	3,337	237	(49,743)	32
33		12,254	5,031	1,731	5,492	0	2,155	3,337	3,337	218	(49,525)	33
34		12,254	5,031	1,731	5,492	0	2,155	3,337	3,337	201	(49,324)	34
35		12,254	5,031	1,731	5,492	0	2,155	3,337	3,337	185	(49,140)	35
36		12,254	5,031	1,731	5,492	0	2,155	3,337	3,337	170	(48,970)	36
37		12,254	5,031	1,731	5,492	0	2,155	3,337	3,337	157	(48,813)	37
38		12,254	5,031	1,731	5,492	0	2,155	3,337	3,337	144	(48,669)	38
39		12,254	5,031	1,731	5,492	0	2,155	3,337	3,337	133	(48,536)	39
40		12,254	5,031	1,731	5,492	0	2,155	3,337	3,337	122	(48,414)	40
41		12,254	5,031	1,731	5,492	0	2,155	3,337	3,337	112	(48,302)	41
42		12,254	5,031	1,731	5,492	0	2,155	3,337	3,337	104	(48,198)	42
43		12,254	5,031	1,731	5,492	0	2,155	3,337	3,337	95	(48,103)	43
44		12,254	5,031	1,731	5,492	0	2,155	3,337	3,337	88	(48,015)	44
45		12,254	5,031	1,731	5,492	0	2,155	3,337	3,337	81	(47,934)	45
46		12,254	5,031	1,731	5,492	0	2,155	3,337	3,337	74	(47,860)	46
47		12,254	5,031	1,731	5,492	0	2,155	3,337	3,337	68	(47,791)	47
48		12,254	5,031	1,731	5,492	0	2,155	3,337	3,337	63	(47,728)	48
49		12,254	5,031	1,731	5,492	0	2,155	3,337	3,337	58	(47,670)	49
50		12,254	5,031	1,731	5,492	0	2,155	3,337	3,337	53	(47,617)	50
51		12,254	5,031	1,731	5,492	0	2,155	3,337	3,337	49	(47,567)	51
52		12,254	5,031	1,731	5,492	0	2,155	3,337	3,337	45	(47,522)	52
53		12,254	5,031	1,731	5,492	0	2,155	3,337	3,337	42	(47,480)	53
54		12,254	5,031	1,731	5,492	0	2,155	3,337	3,337	38	(47,442)	54
55		12,254	5,031	1,731	5,492	0	2,155	3,337	3,337	35	(47,407)	55
56		12,254	5,031	1,731	5,492	0	2,155	3,337	(102,513)	(1,000)	(48,406)	56
Total	105,850	686,224	281,736	96,936	307,552	105,850	79,128	122,574	16,724	(48,406)	(3,313,157)	

BAY STATE GAS COMPANY MAIN ORDER

PROJECT ID #

197D0016

Bay State Gas Company

D.T.E. 05-27

Attachment RR-DTE-136(b)

Page 27 of 62

DIVISION: LAWRENCEPRE-CONSTRUCTION
IRR

RATE OF RETURN

9.03%

DESCRIPTION OF PROJECT:

This authorization provides for the installation of 1300' of 4" PE main on Campbell St., 3770' of 2" PE main on Joanne Dr., 720' of 2" PE main on Donna Dr. North Andover. Joanne Dr. and Donna Dr. will be Open Trench inside Campbell Forest. This will serve thirty four single family homes. The ROR was calculated with 2" pipe on Campbell St. 4" pipe will be installed.

SERVICE COST=\$

\$23,800

MIS = \$

CUSTOMER CONTRIBUTION = \$

\$0.00

COST RECORD	BUDGET	ACTUAL	VARIANCE
COMPANY LABOR	\$629		
PURCHASES	\$41,975		
MATERIAL	\$6,141		
OVERHEAD	\$5,132		
TOTAL	\$53,877		

START DATE: / /96

COMPLETION DATE: / /96

CCS No.

ESTIMATOR: Nerden

PIPE INSTALLED		PIPE		FOOTAGE		WORK ORDER
STREET NAME AND TOWN		SIZE	TYPE	EST.	ACTUAL	NUMBER
1	Campbell St.	4	PE	1300		4433-5
2	Joanne Dr.	2	PE	3770	3800	4433-8
	Donna Dr.	2	PE	720	695	4433-9
		0		5790	0	
5		0		0		

Tie-in

4433 44

PIPE RETIRED		PIPE		FOOTAGE		WORK ORDER	
STREET NAME AND TOWN		SIZE	TYPE	EST.	ACTUAL	NUMBER	INST. YR.
1							
2							
3							
4							
5							

PLACE AN "X" NEXT TO ALL THAT APPLY

GROWTH x # OF SERVICES 34EXTENSION x PRESSURE 3BUILDER POLICY x CO. LABOR xREPLACEMENT x CONTRACTOR/TEMP. xMUNICIPAL x RESIDENTIAL xSYSTEM IMPROVE x COMMERCIAL/INDUS. x

LOCAL APPROVAL

CUST. CONN. SUPERVISOR: John Miller 7-17-97DIVISION ENGINEER: [Signature]SALES LEADER: [Signature] 7-21-97CORPORATE APPROVAL OVER \$25,000 [Signature] 7-21-97LEADER, SALES & CUST. CONN. [Signature] 8-11-97LEADER, SERVICES DELIVERY [Signature] 8-15-97CHIEF FINANCIAL OFFICER: [Signature] 9-1-97

ATTACHMENT RR-DTE-136 (b)

Revenue Producing Plants Additions
Account 367 (Mains) > \$50K and < \$100K

List No. 9 (on DTE-3-27 Revised)

POST-CONSTRUCTION

Bay State Gas Company
D.T.E. 05-27
Attachment RR-DTE-136(b)
Page 29 of 62

POST CONSTRUCTION - RATE OF RETURN ESTIMATE

WORKPAPER

Project: Turner Street
Attleboro

Total Capital and O&M Costs

Capital		
Mains	\$	65,573
Services		9,230
Meters		0
Marginal Capital		1,378
Total	\$	76,181

O & M costs \$ 1,446 annual

Property Tax Rate \$ 26.08 per thousand

Meter Counts, Mcf Load and Net Revenue

Meter Counts	2
Load (Mcf)	16,219
Net Revenue	\$ 19,873 annual

Results Summary

	15 Yrs.
* IRR	12.64%
* NPV	\$19,048
* Customer Contribution	\$0

Year	Investment	Revenue	O&M	Property Tax	Profit Before Taxes	Depreciation 20 Year Class	Income Taxes	Total Net Income	Total Net Cash Flow (\$76,181)	P.V. OF Cash Flow (\$76,181)	Payback Calculation (\$76,181)	Payback Period
1	576,181	\$19,873	\$1,446	\$1,987	\$16,440	\$2,857	\$5,329	\$8,255	\$11,111	10,230	(\$65,951)	0
2		19,873	1,446	1,987	16,440	5,500	4,292	6,649	12,148	10,296	(\$55,655)	1
3		19,873	1,446	1,987	16,440	5,087	4,454	6,899	11,986	9,353	(46,302)	2
4		19,873	1,446	1,987	16,440	4,706	4,603	7,131	11,837	8,503	(37,799)	3
5		19,873	1,446	1,987	16,440	4,352	4,742	7,346	11,698	7,737	(30,062)	4
6		19,873	1,446	1,987	16,440	4,026	4,870	7,544	11,570	7,045	(23,017)	5
7		19,873	1,446	1,987	16,440	3,724	4,989	7,728	11,451	6,419	(16,598)	6
8		19,873	1,446	1,987	16,440	3,445	5,098	7,897	11,342	5,853	(10,744)	7
9		19,873	1,446	1,987	16,440	3,399	5,116	7,925	11,324	5,380	(5,364)	8
10		19,873	1,446	1,987	16,440	3,398	5,116	7,925	11,324	4,953	(411)	9
11		19,873	1,446	1,987	16,440	3,399	5,116	7,925	11,324	4,560	4,150	10
12		19,873	1,446	1,987	16,440	3,398	5,116	7,925	11,324	4,198	8,348	11
13		19,873	1,446	1,987	16,440	3,399	5,116	7,925	11,324	3,865	12,213	12
14		19,873	1,446	1,987	16,440	3,398	5,116	7,925	11,324	3,558	15,772	13
15		19,873	1,446	1,987	16,440	3,399	5,116	7,925	11,324	3,276	19,048	14
16		19,873	1,446	1,987	16,440	3,398	5,116	7,925	11,324	3,016	22,064	15
17		19,873	1,446	1,987	16,440	3,399	5,116	7,925	11,324	2,777	24,841	16
18		19,873	1,446	1,987	16,440	3,398	5,116	7,925	11,324	2,556	27,397	17
19		19,873	1,446	1,987	16,440	3,399	5,116	7,925	11,324	2,354	29,750	18
20		19,873	1,446	1,987	16,440	3,398	5,116	7,925	11,324	2,167	31,917	19
21		19,873	1,446	1,987	16,440	1,700	5,783	8,958	10,657	1,877	33,794	20
22		19,873	1,446	1,987	16,440	0	6,449	9,991	9,991	1,620	35,415	21
23		19,873	1,446	1,987	16,440	0	6,449	9,991	9,991	1,492	36,906	22
24		19,873	1,446	1,987	16,440	0	6,449	9,991	9,991	1,373	38,280	23
25		19,873	1,446	1,987	16,440	0	6,449	9,991	9,991	1,264	39,544	24
26		19,873	1,446	1,987	16,440	0	6,449	9,991	9,991	1,164	40,708	25
27		19,873	1,446	1,987	16,440	0	6,449	9,991	9,991	1,072	41,779	26
28		19,873	1,446	1,987	16,440	0	6,449	9,991	9,991	987	42,766	27
29		19,873	1,446	1,987	16,440	0	6,449	9,991	9,991	908	43,674	28
30		19,873	1,446	1,987	16,440	0	6,449	9,991	9,991	836	44,510	29
31		19,873	1,446	1,987	16,440	0	6,449	9,991	9,991	770	45,280	30
32		19,873	1,446	1,987	16,440	0	6,449	9,991	9,991	709	45,989	31
33		19,873	1,446	1,987	16,440	0	6,449	9,991	9,991	652	46,641	32
34		19,873	1,446	1,987	16,440	0	6,449	9,991	9,991	601	47,242	33
35		19,873	1,446	1,987	16,440	0	6,449	9,991	9,991	553	47,795	34
36		19,873	1,446	1,987	16,440	0	6,449	9,991	9,991	509	48,304	35
37		19,873	1,446	1,987	16,440	0	6,449	9,991	9,991	469	48,773	36
38		19,873	1,446	1,987	16,440	0	6,449	9,991	9,991	432	49,205	37
39		19,873	1,446	1,987	16,440	0	6,449	9,991	9,991	397	49,602	38
40		19,873	1,446	1,987	16,440	0	6,449	9,991	9,991	366	49,968	39
41		19,873	1,446	1,987	16,440	0	6,449	9,991	9,991	337	50,304	40
42		19,873	1,446	1,987	16,440	0	6,449	9,991	9,991	310	50,614	41
43		19,873	1,446	1,987	16,440	0	6,449	9,991	9,991	285	50,900	42
44		19,873	1,446	1,987	16,440	0	6,449	9,991	9,991	263	51,163	43
45		19,873	1,446	1,987	16,440	0	6,449	9,991	9,991	242	51,404	44
46		19,873	1,446	1,987	16,440	0	6,449	9,991	9,991	223	51,627	45
47		19,873	1,446	1,987	16,440	0	6,449	9,991	9,991	205	51,832	46
48		19,873	1,446	1,987	16,440	0	6,449	9,991	9,991	189	52,021	47
49		19,873	1,446	1,987	16,440	0	6,449	9,991	9,991	174	52,195	48
50		19,873	1,446	1,987	16,440	0	6,449	9,991	9,991	160	52,355	49
51		19,873	1,446	1,987	16,440	0	6,449	9,991	9,991	147	52,502	50
52		19,873	1,446	1,987	16,440	0	6,449	9,991	9,991	136	52,638	51
53		19,873	1,446	1,987	16,440	0	6,449	9,991	9,991	125	52,762	52
54		19,873	1,446	1,987	16,440	0	6,449	9,991	9,991	115	52,877	53
55		19,873	1,446	1,987	16,440	0	6,449	9,991	9,991	106	52,983	54
56		19,873	1,446	1,987	16,440	0	6,449	9,991	(66,190)	(645)	52,338	55
Total	76,181	1,112,888	80,976	111,272	920,640	76,181	331,281	513,178	436,997	52,338	1,534,106	56

PRE-CONSTRUCTION IRR

CO. MAIN ORDER

Bay State Gas Company
D.T.E. 05-27
Attachment ROR E 32.15%
Page 30 of 62

DIVISION BROCKTON

WORK CODE MNECC

DESCRIPTION/COMMENTS

NEW MAIN - CROWN DYE AND CUMBERLAND ENGINEERING

This main will service two industrial customers and there is a potential
for more. The 32% ROR includes a \$28,000 system improvement.

DOWNTOWN X

SUBURBS

BUILDER POLICY

CUST. CONTR. \$0

COST RECORD	SOURCE	BUDGET	ACTUAL	VARIANCE
MATERIAL		15,670.00		
LABOR		3,660.00		
CONTRACTOR		33,775.00		
OVERHEAD				
TOTAL		\$53,105.00		

B95D0072
START DATE 10-31-95
COMP. DATE 12-27-95
ESTIMATOR ajm 8/29/95
PROJ/NOMAD
COMPLETE

Y	N
---	---

SUPPLEMENT

Y	N
---	---

PIPE INSTALLED: FROM: (1) Private road to Cumberland Eng.
(2) County St

TO: (1) River St
(2) 4" main behind the Home Depot Mall

	STREET NAME & TOWN	SIZE	TYPE	FOOTAGE		ACCOUNT NUMBER	DIST. %	COST PER FT.
				ESTIMATE	ACTUAL			
1	Turner St Attleboro	6.0	PP	1270	1145	352801	352809	
	Capt. Courtois Dr.	4.0	PP	1600	1224	32617	352798	
3								
4								
5								
6								

	PIPE RETIRED	SIZE	TYPE	FOOTAGE		ACCOUNT NUMBER	INST. YEAR	COST PER FT.
				ESTIMATE	ACTUAL			
1								
2								
3								
4								
5								
6								

EXTENSION	X
REPLACEMENT	
MUNICIPAL IMP	
SYSTEM IMP	X
NO. OF SERVICES	2
RATE OF RETURN	X
FORGETED	
MIT RECEIVED	

GROWTH
BUILDER POLICY
CONTRIBUTION
CO. LABOR
SPECIAL CREWS
RESIDENTIAL
COMM./INDUST.
PRESSURE

X
X
H

(ACCOUNTING INFO) CLOSE TO PLANT

APPROVAL: UNDER 25K

[Signature] 9/15/95
DEPT. MGR. *[Signature]* 9/14/95
DIV. ENG. *[Signature]* 9/14/95
DIV. MGR. *[Signature]*

APPROVAL: OVER 25K

CORP. MARKET
SR. VP OPER.
CONTROLLER

ATTACHMENT RR-DTE-136 (b)

Revenue Producing Plants Additions
Account 367 (Mains) > \$50K and < \$100K

List No. 10 (on DTE-3-27 Revised)

POST CONSTRUCTION - RATE OF RETURN ESTIMATE

WORKPAPER

POST-CONSTRUCTION

Project: Millpond Estates
North Andover

Total Capital and O&M Costs

Capital	
Mains	\$ 55,775
Services	23,790
Meters	0
Marginal Capital	0
Total	\$ 79,565

Meter Counts, Mcf Load and Net Revenue

Meter Counts	78
Load (Mcf)	9,282
Net Revenue	\$ 33,120 annual

O & M costs \$ 12,740 annual

Property Tax Rate \$ 16.35 per thousand

Results Summary

55 Yrs.
* IRR 16.56%
* NPV \$68,651
* Customer Contribution \$0

Year	Investment	Revenue	O&M	Property Tax	Profit Before Taxes	Depreciation 20 Year Class	Income Taxes	Total Net Income	Total Net Cash Flow (\$79,565)	P.V. OF Cash Flow (\$79,565)	Payback Calculation (\$79,565)	Payback Period
1	\$79,565	\$33,120	\$12,740	\$1,301	\$19,079	\$2,984	\$6,314	\$9,781	\$12,765	11,752	(\$67,813)	1
2		33,120	12,740	1,301	19,079	5,744	5,231	8,104	13,848	11,737	(\$56,076)	2
3		33,120	12,740	1,301	19,079	5,313	5,401	8,366	13,678	10,673	(\$45,403)	3
4		33,120	12,740	1,301	19,079	4,915	5,557	8,608	13,522	9,714	(\$35,688)	4
5		33,120	12,740	1,301	19,079	4,546	5,701	8,832	13,378	8,848	(\$26,841)	5
6		33,120	12,740	1,301	19,079	4,205	5,835	9,039	13,244	8,064	(\$18,777)	6
7		33,120	12,740	1,301	19,079	3,889	5,959	9,231	13,120	7,355	(\$11,422)	7
8		33,120	12,740	1,301	19,079	3,598	6,073	9,408	13,006	6,712	(\$4,710)	8
9		33,120	12,740	1,301	19,079	3,350	6,092	9,437	12,987	6,171	1,461	9
10		33,120	12,740	1,301	19,079	3,149	6,092	9,437	12,987	5,681	7,141	10
11		33,120	12,740	1,301	19,079	3,000	6,092	9,437	12,987	5,230	12,371	11
12		33,120	12,740	1,301	19,079	3,000	6,092	9,437	12,987	4,815	17,186	12
13		33,120	12,740	1,301	19,079	3,000	6,092	9,437	12,987	4,433	21,619	13
14		33,120	12,740	1,301	19,079	3,000	6,092	9,437	12,987	4,081	25,700	14
15		33,120	12,740	1,301	19,079	3,000	6,092	9,437	12,987	3,757	29,457	15
16		33,120	12,740	1,301	19,079	3,000	6,092	9,437	12,987	3,459	32,916	16
17		33,120	12,740	1,301	19,079	3,000	6,092	9,437	12,987	3,185	36,101	17
18		33,120	12,740	1,301	19,079	3,000	6,092	9,437	12,987	2,932	39,032	18
19		33,120	12,740	1,301	19,079	3,000	6,092	9,437	12,987	2,699	41,732	19
20		33,120	12,740	1,301	19,079	3,000	6,092	9,437	12,987	2,485	44,216	20
21		33,120	12,740	1,301	19,079	1,775	6,788	10,516	12,291	2,165	46,382	21
22		33,120	12,740	1,301	19,079	0	7,485	11,594	11,594	1,880	48,262	22
23		33,120	12,740	1,301	19,079	0	7,485	11,594	11,594	1,731	49,993	23
24		33,120	12,740	1,301	19,079	0	7,485	11,594	11,594	1,594	51,587	24
25		33,120	12,740	1,301	19,079	0	7,485	11,594	11,594	1,467	53,054	25
26		33,120	12,740	1,301	19,079	0	7,485	11,594	11,594	1,351	54,405	26
27		33,120	12,740	1,301	19,079	0	7,485	11,594	11,594	1,244	55,648	27
28		33,120	12,740	1,301	19,079	0	7,485	11,594	11,594	1,145	56,793	28
29		33,120	12,740	1,301	19,079	0	7,485	11,594	11,594	1,054	57,847	29
30		33,120	12,740	1,301	19,079	0	7,485	11,594	11,594	970	58,818	30
31		33,120	12,740	1,301	19,079	0	7,485	11,594	11,594	893	59,711	31
32		33,120	12,740	1,301	19,079	0	7,485	11,594	11,594	822	60,533	32
33		33,120	12,740	1,301	19,079	0	7,485	11,594	11,594	757	61,291	33
34		33,120	12,740	1,301	19,079	0	7,485	11,594	11,594	697	61,988	34
35		33,120	12,740	1,301	19,079	0	7,485	11,594	11,594	642	62,630	35
36		33,120	12,740	1,301	19,079	0	7,485	11,594	11,594	591	63,221	36
37		33,120	12,740	1,301	19,079	0	7,485	11,594	11,594	544	63,764	37
38		33,120	12,740	1,301	19,079	0	7,485	11,594	11,594	501	64,265	38
39		33,120	12,740	1,301	19,079	0	7,485	11,594	11,594	461	64,726	39
40		33,120	12,740	1,301	19,079	0	7,485	11,594	11,594	424	65,151	40
41		33,120	12,740	1,301	19,079	0	7,485	11,594	11,594	391	65,542	41
42		33,120	12,740	1,301	19,079	0	7,485	11,594	11,594	360	65,901	42
43		33,120	12,740	1,301	19,079	0	7,485	11,594	11,594	331	66,233	43
44		33,120	12,740	1,301	19,079	0	7,485	11,594	11,594	305	66,538	44
45		33,120	12,740	1,301	19,079	0	7,485	11,594	11,594	281	66,818	45
46		33,120	12,740	1,301	19,079	0	7,485	11,594	11,594	258	67,077	46
47		33,120	12,740	1,301	19,079	0	7,485	11,594	11,594	238	67,315	47
48		33,120	12,740	1,301	19,079	0	7,485	11,594	11,594	219	67,534	48
49		33,120	12,740	1,301	19,079	0	7,485	11,594	11,594	202	67,735	49
50		33,120	12,740	1,301	19,079	0	7,485	11,594	11,594	186	67,921	50
51		33,120	12,740	1,301	19,079	0	7,485	11,594	11,594	171	68,092	51
52		33,120	12,740	1,301	19,079	0	7,485	11,594	11,594	157	68,249	52
53		33,120	12,740	1,301	19,079	0	7,485	11,594	11,594	145	68,394	53
54		33,120	12,740	1,301	19,079	0	7,485	11,594	11,594	133	68,528	54
55		33,120	12,740	1,301	19,079	0	7,485	11,594	11,594	123	68,651	55
56		33,120	12,740	1,301	19,079	0	7,485	11,594	(67,971)	(663)	67,988	56
Total	79,565	1,854,720	713,440	72,856	1,068,424	79,565	387,929	600,930	521,365	67,988	2,201,221	

PRE-CONSTRUCTION IRR

ROR #1

MILLPOND TOWNHOME EXPANSION

INPUT ==>									
Customers Count	Capital	Margin	Capital	Total	Customer Rebates	O & M Expense	Property Tax	Discount Rate	
Yr 1	40	\$100,082	\$5,808	\$105,890	\$0	\$183	\$14.46	9.58%	\$19.42
Yr 2	22	\$2,530	172	2,702	9,903				\$500
Yr 3	12	\$1,320	90	1,410	5,401				\$115
Yr 4	0	\$0	0	0	0				107
Yr 5	0	\$0	0	0	0				\$450.12
Total	74	103,932	7,067	110,999	33,309				\$163
									\$14.46
									39.225%

OUTPUT==>				
IRR	10 Years	15 Years	20 Years	25 Years
NPV	3.52%	8.53%	10.39%	11.86%
	(\$28,262)	(\$5,958)	\$6,526	\$25,391

DCF Analysis									
Year	Net Revenue	O & M Expense	Customer Rebates	Prop. Tax	Profit B Tax	Deprec Sch.	Deprec Amount	Income Tax	Year
1	\$18,005	\$8,520	\$0	\$1,548	\$9,939	0.0375	\$4,008	\$2,326	1
2	27,907	10,106		1,585	16,217	0.0722	7,818	3,295	2
3	33,309	12,062		1,605	19,642	0.0688	7,385	4,808	3
4	33,309	12,062		1,605	19,642	0.0618	6,885	5,004	4
5	33,309	12,062		1,605	19,642	0.0571	6,368	5,207	5
6	33,309	12,062		1,605	19,642	0.0529	5,890	5,394	6
7	33,309	12,062		1,605	19,642	0.0489	5,448	5,568	7
8	33,309	12,062		1,605	19,642	0.0452	5,040	5,728	8
9	33,309	12,062		1,605	19,642	0.0418	4,660	5,759	9
10	33,309	12,062		1,605	19,642	0.0446	4,953	5,762	10
11	33,309	12,062		1,605	19,642	0.0446	4,953	5,762	11
12	33,309	12,062		1,605	19,642	0.0446	4,953	5,762	12
13	33,309	12,062		1,605	19,642	0.0446	4,953	5,762	13
14	33,309	12,062		1,605	19,642	0.0446	4,953	5,762	14
15	33,309	12,062		1,605	19,642	0.0446	4,953	5,762	15
16	33,309	12,062		1,605	19,642	0.0446	4,953	5,762	16
17	33,309	12,062		1,605	19,642	0.0446	4,953	5,762	17
18	33,309	12,062		1,605	19,642	0.0446	4,953	5,762	18
19	33,309	12,062		1,605	19,642	0.0446	4,953	5,762	19
20	33,309	12,062		1,605	19,642	0.0446	4,953	5,762	20
21	33,309	12,062		1,605	19,642	0.0446	4,953	5,762	21
22	33,309	12,062		1,605	19,642	0.0446	4,953	5,762	22
23	33,309	12,062		1,605	19,642	0.0446	4,953	5,762	23
24	33,309	12,062		1,605	19,642	0.0446	4,953	5,762	24
25	33,309	12,062		1,605	19,642	0.0446	4,953	5,762	25
26	33,309	12,062		1,605	19,642	0.0446	4,953	5,762	26
27	33,309	12,062		1,605	19,642	0.0446	4,953	5,762	27
28	33,309	12,062		1,605	19,642	0.0446	4,953	5,762	28
29	33,309	12,062		1,605	19,642	0.0446	4,953	5,762	29
30	33,309	12,062		1,605	19,642	0.0446	4,953	5,762	30
31	33,309	12,062		1,605	19,642	0.0446	4,953	5,762	31
32	33,309	12,062		1,605	19,642	0.0446	4,953	5,762	32
33	33,309	12,062		1,605	19,642	0.0446	4,953	5,762	33
34	33,309	12,062		1,605	19,642	0.0446	4,953	5,762	34
35	33,309	12,062		1,605	19,642	0.0446	4,953	5,762	35
36	33,309	12,062		1,605	19,642	0.0446	4,953	5,762	36
37	33,309	12,062		1,605	19,642	0.0446	4,953	5,762	37
38	33,309	12,062		1,605	19,642	0.0446	4,953	5,762	38
39	33,309	12,062		1,605	19,642	0.0446	4,953	5,762	39
40	33,309	12,062		1,605	19,642	0.0446	4,953	5,762	40
41	33,309	12,062		1,605	19,642	0.0446	4,953	5,762	41
42	33,309	12,062		1,605	19,642	0.0446	4,953	5,762	42
43	33,309	12,062		1,605	19,642	0.0446	4,953	5,762	43
44	33,309	12,062		1,605	19,642	0.0446	4,953	5,762	44
45	33,309	12,062		1,605	19,642	0.0446	4,953	5,762	45
46	33,309	12,062		1,605	19,642	0.0446	4,953	5,762	46
47	33,309	12,062		1,605	19,642	0.0446	4,953	5,762	47
48	33,309	12,062		1,605	19,642	0.0446	4,953	5,762	48
49	33,309	12,062		1,605	19,642	0.0446	4,953	5,762	49
50	33,309	12,062		1,605	19,642	0.0446	4,953	5,762	50

110,999

ROR #2

MILLPOND TOWNHOME EXPANSION

INPUT ==>

Customer Count	Capital	Marginal Capital	Total Capital	Net Revenue	Customer Rebates	O & M Expense	Property Tax	Discount Rate
Yr 1	40	\$100,062	\$6,808	\$16,967	\$0	\$163	\$14.46	9.58%
Yr 2	22	\$2,530	172	9,332				
Yr 3	12	\$1,320	90	5,090				
Yr 4	0	\$0	0	0				
Yr 5	0	\$0	0	0				
Total	74	103,932	7,067	31,389				

OUTPUT==>

IRR	10 Years	15 Years	20 Years	25 Years	50 Years
NPV	1.93%	7.17%	9.19%	10.00%	10.85%
	(\$34,918)	(\$15,404)	(\$3,054)	\$3,723	\$13,982

DCF Analysis

Year	Net Revenue	O & M Expense	Customer Rebates	Prop. Tax	Profit B Tax	Deprec Sch.	Deprec Amount	Income Tax	Net Cash Flow	pv Cash Flow	Pay Back	Year
1	\$16,967	\$6,520	\$0	\$1,546	\$8,901	0.0375	\$4,009	\$1,919	\$4,280	\$3,906	(\$102,982)	1
2	26,299	10,106		1,585	14,608	0.0722	7,818	2,864	10,535	8,773	(94,205)	2
3	31,389	12,062		1,605	17,722	0.0686	6,885	4,055	13,667	10,367	(83,822)	3
4	31,389	12,062		1,605	17,722	0.0618	6,388	4,251	13,471	9,343	(74,479)	4
5	31,389	12,062		1,605	17,722	0.0571	5,890	4,454	13,268	8,397	(66,082)	5
6	31,389	12,062		1,605	17,722	0.0529	5,448	4,641	13,081	7,555	(58,527)	6
7	31,389	12,062		1,605	17,722	0.0489	5,040	4,814	12,907	6,803	(51,724)	7
8	31,389	12,062		1,605	17,722	0.0452	4,680	5,005	12,747	6,131	(45,592)	8
9	31,389	12,062		1,605	17,722	0.0446	4,953	5,009	12,718	5,582	(40,010)	9
10	31,389	12,062		1,605	17,722	0.0446	4,953	5,009	12,713	5,093	(34,918)	10
11	31,389	12,062		1,605	17,722	0.0446	4,953	5,009	12,713	4,647	(30,271)	11
12	31,389	12,062		1,605	17,722	0.0446	4,953	5,009	12,713	4,241	(26,030)	12
13	31,389	12,062		1,605	17,722	0.0446	4,953	5,009	12,713	3,870	(22,159)	13
14	31,389	12,062		1,605	17,722	0.0446	4,953	5,009	12,713	3,532	(18,628)	14
15	31,389	12,062		1,605	17,722	0.0446	4,953	5,009	12,713	3,223	(15,404)	15
16	31,389	12,062		1,605	17,722	0.0446	4,953	5,009	12,713	2,941	(12,463)	16
17	31,389	12,062		1,605	17,722	0.0446	4,953	5,009	12,713	2,684	(9,779)	17
18	31,389	12,062		1,605	17,722	0.0446	4,953	5,009	12,713	2,449	(7,330)	18
19	31,389	12,062		1,605	17,722	0.0446	4,953	5,009	12,713	2,235	(5,094)	19
20	31,389	12,062		1,605	17,722	0.0446	4,953	5,009	12,713	2,040	(3,054)	20
21	31,389	12,062		1,605	17,722	0.0446	4,953	5,009	12,713	1,776	(1,350)	21
22	31,389	12,062		1,605	17,722	0.0223	123	6,903	10,819	1,446	116	22
23	31,389	12,062		1,605	17,722		31	6,939	10,783	1,315	1,431	23
24	31,389	12,062		1,605	17,722		0	6,951	10,770	1,199	2,830	24
25	31,389	12,062		1,605	17,722		0	6,951	10,770	1,094	3,723	25
26	31,389	12,062		1,605	17,722			6,951	10,770	998	4,722	26
27	31,389	12,062		1,605	17,722			6,951	10,770	911	5,633	27
28	31,389	12,062		1,605	17,722			6,951	10,770	831	6,464	28
29	31,389	12,062		1,605	17,722			6,951	10,770	759	7,222	29
30	31,389	12,062		1,605	17,722			6,951	10,770	692	7,915	30
31	31,389	12,062		1,605	17,722			6,951	10,770	632	8,547	31
32	31,389	12,062		1,605	17,722			6,951	10,770	577	9,123	32
33	31,389	12,062		1,605	17,722			6,951	10,770	526	9,649	33
34	31,389	12,062		1,605	17,722			6,951	10,770	480	10,129	34
35	31,389	12,062		1,605	17,722			6,951	10,770	438	10,567	35
36	31,389	12,062		1,605	17,722			6,951	10,770	400	10,967	36
37	31,389	12,062		1,605	17,722			6,951	10,770	365	11,332	37
38	31,389	12,062		1,605	17,722			6,951	10,770	333	11,685	38
39	31,389	12,062		1,605	17,722			6,951	10,770	304	11,969	39
40	31,389	12,062		1,605	17,722			6,951	10,770	277	12,246	40
41	31,389	12,062		1,605	17,722			6,951	10,770	253	12,489	41
42	31,389	12,062		1,605	17,722			6,951	10,770	231	12,730	42
43	31,389	12,062		1,605	17,722			6,951	10,770	211	12,941	43
44	31,389	12,062		1,605	17,722			6,951	10,770	192	13,134	44
45	31,389	12,062		1,605	17,722			6,951	10,770	176	13,309	45
46	31,389	12,062		1,605	17,722			6,951	10,770	160	13,469	46
47	31,389	12,062		1,605	17,722			6,951	10,770	146	13,615	47
48	31,389	12,062		1,605	17,722			6,951	10,770	133	13,749	48
49	31,389	12,062		1,605	17,722			6,951	10,770	122	13,871	49
50	31,389	12,062		1,605	17,722		110,999	6,951	10,770	111	13,982	50

Cost/Foot of Main(Builder Dig) \$19.42
 Cost/Service \$500
 Cost/Meter \$115
 MCF/Meter 92
 Net Rev./Meter \$424.17
 O&M/Meter \$163
 Property Tax \$14.46
 Effective Tax Rate 39.225%

ROR #3

MILLPOND TOWNHOME EXPANSION

INPUT ==>

Customers Count	Capital	Marginal Capital	Total Capital	Net Revenue	Customer Rebates	O & M Expense	Property Tax	Discount Rate
Yr 1	40	\$100,082	\$6,808	\$106,890	\$0	\$163	\$14.46	9.58%
Yr 2	22	\$2,530	172	2,702				
Yr 3	12	\$1,320	90	1,410				
Yr 4	10	\$1,150	78	1,228				
Yr 5	6	\$690	47	737				
Total	90	105,772	7,192	112,964	40,511			

OUTPUT==>

	10 Years	15 Years	20 Years	25 Years	50 Years
IRR	5.59%	10.40%	12.12%	12.78%	13.38%
NPV	(\$19,865)	\$5,762	\$21,965	\$31,183	\$45,196

DCF Analysis

Year	Net Revenue	O & M Expense	Customer Rebates	Prop. Tax	Profit B Tax	Deprec Sch.	Deprec Amount	Income Tax	Net Cash Flow	PV Cash Flow	Pay Back	Year
1	\$18,005	\$6,520	\$0	\$1,548	\$9,939	0.0375	\$4,008	\$2,326	\$4,911	\$4,481	(\$102,406)	1
2	27,907	10,106		1,585	18,217	0.0722	7,818	3,295	11,512	9,587	(82,819)	2
3	33,308	12,062		1,605	19,642	0.0688	7,385	4,608	13,606	10,340	(82,478)	3
4	37,810	13,692		1,623	22,495	0.0618	6,931	6,105	15,853	10,856	(71,822)	4
5	40,511	14,670		1,633	24,207	0.0571	6,484	6,952	17,255	10,921	(60,701)	5
6	40,511	14,670		1,633	24,207	0.0529	6,026	7,132	17,076	8,863	(50,839)	6
7	40,511	14,670		1,633	24,207	0.0489	5,573	7,309	16,898	8,907	(41,932)	7
8	40,511	14,670		1,633	24,207	0.0452	5,166	7,473	16,734	8,048	(33,883)	8
9	40,511	14,670		1,633	24,207	0.0416	5,067	7,508	16,700	7,330	(26,552)	9
10	40,511	14,670		1,633	24,207	0.0446	5,052	7,514	16,693	6,887	(19,865)	10
11	40,511	14,670		1,633	24,207	0.0446	5,044	7,517	16,691	6,101	(13,764)	11
12	40,511	14,670		1,633	24,207	0.0446	5,040	7,518	16,689	5,567	(8,196)	12
13	40,511	14,670		1,633	24,207	0.0446	5,039	7,519	16,689	5,081	(3,116)	13
14	40,511	14,670		1,633	24,207	0.0446	5,040	7,518	16,689	4,836	1,521	14
15	40,511	14,670		1,633	24,207	0.0446	5,040	7,519	16,689	4,231	5,752	15
16	40,511	14,670		1,633	24,207	0.0446	5,040	7,518	16,689	3,861	9,613	16
17	40,511	14,670		1,633	24,207	0.0446	5,040	7,518	16,689	3,524	13,137	17
18	40,511	14,670		1,633	24,207	0.0446	5,039	7,519	16,689	3,216	16,352	18
19	40,511	14,670		1,633	24,207	0.0446	5,040	7,518	16,689	2,935	19,267	19
20	40,511	14,670		1,633	24,207	0.0446	5,039	7,519	16,689	2,678	21,965	20
21	40,511	14,670		1,633	24,207	0.0223	2,656	8,454	15,754	2,307	24,272	21
22	40,511	14,670		1,633	24,207		211	9,413	14,795	1,977	26,248	22
23	40,511	14,670		1,633	24,207		119	9,449	14,759	1,800	28,049	23
24	40,511	14,670		1,633	24,207		60	9,472	14,736	1,640	29,689	24
25	40,511	14,670		1,633	24,207		16	9,489	14,718	1,495	31,183	25
26	40,511	14,670		1,633	24,207			9,495	14,712	1,364	32,547	26
27	40,511	14,670		1,633	24,207			9,495	14,712	1,244	33,791	27
28	40,511	14,670		1,633	24,207			9,495	14,712	1,136	34,927	28
29	40,511	14,670		1,633	24,207			9,495	14,712	1,036	35,963	29
30	40,511	14,670		1,633	24,207			9,495	14,712	946	36,909	30
31	40,511	14,670		1,633	24,207			9,495	14,712	853	37,772	31
32	40,511	14,670		1,633	24,207			9,495	14,712	788	38,559	32
33	40,511	14,670		1,633	24,207			9,495	14,712	719	39,278	33
34	40,511	14,670		1,633	24,207			9,495	14,712	658	39,934	34
35	40,511	14,670		1,633	24,207			9,495	14,712	599	40,532	35
36	40,511	14,670		1,633	24,207			9,495	14,712	546	41,078	36
37	40,511	14,670		1,633	24,207			9,495	14,712	498	41,577	37
38	40,511	14,670		1,633	24,207			9,495	14,712	455	42,032	38
39	40,511	14,670		1,633	24,207			9,495	14,712	415	42,447	39
40	40,511	14,670		1,633	24,207			9,495	14,712	378	42,826	40
41	40,511	14,670		1,633	24,207			9,495	14,712	346	43,171	41
42	40,511	14,670		1,633	24,207			9,495	14,712	315	43,487	42
43	40,511	14,670		1,633	24,207			9,495	14,712	288	43,775	43
44	40,511	14,670		1,633	24,207			9,495	14,712	263	44,037	44
45	40,511	14,670		1,633	24,207			9,495	14,712	240	44,278	45
46	40,511	14,670		1,633	24,207			9,495	14,712	219	44,496	46
47	40,511	14,670		1,633	24,207			9,495	14,712	200	44,695	47
48	40,511	14,670		1,633	24,207			9,495	14,712	182	44,878	48
49	40,511	14,670		1,633	24,207			9,495	14,712	166	45,044	49
50	40,511	14,670		1,633	24,207			9,495	14,712	152	45,195	50

112,964

OUTPUT==>

OUTPUT==>

**PRE-CONSTRUCTION
IRR**

112,984

Memo

PRE-CONSTRUCTION IRR

TO: PLEASE SIGN AND FORWARD TO NEXT ON THE LIST
P. Reinhardt
T. Sherman
P. LaShoto

FROM: M. Poulin

DATE: June 9, 1995

SUBJECT: MILLPOND SYSTEM EXPANSION

CC: T. Black, D. Shaw, J. Snow

Attached for your approval is the System Expansion project for Millpond Townehomes in North Andover.

Millpond is the 120-unit complex that we attempted to convert two years ago. The average square footage of the units is 1,600. We were unsuccessful at that time but continued interest on the part of the homeowners and a new, less expensive main route has led us to try again.

Attached are the various scenario's of the rate of return that we have been asked to provide. Common to all the scenario's is 12 mcf per customer for water heating load. We are using 12mcf because we think only half the units will install water heaters due to difficult installations. The differences in the four scenario's are as follows:

- ▶ ROR #1 - Uses the company standard of 95 mcf for heat, and a total of 74 conversions(62%) over three years. The rate of return for this scenario is 11.86%.
- ▶ ROR #2 - Reduces the estimated heat consumption by 15% to 80 mcf, again using a 62% conversion rate. The rate of return for this scenario is 10.85%.
- ▶ ROR # 3 - Uses 95 mcf for heat but projects an additional total of 16 conversions in years four and five, giving a total conversion rate of 75%. The rate of return is 13.38%
- ▶ ROR # 4 - Uses the 80 mcf figure for heat and the 75% conversion rate. The rate of return is 12.29%.

In any case we would not proceed with this project without having 40 signed contracts in hand.

Also attached for your information is a location map for the project and the authorization for your signature. if you have any questions please call me at extension 4240.

ATTACHMENT RR-DTE-136 (b)

Revenue Producing Plants Additions
Account 367 (Mains) > \$50K and < \$100K

List No. // (on DTE-3-27 Revised)

POST CONSTRUCTION - RATE OF RETURN ESTIMATE

WORKPAPER

POST-CONSTRUCTION

Project: Edgewood Life Care
North Andover

Total Capital and O&M Costs

Meter Counts, Mcf Load and Net Revenue

Capital			Meter Counts	1
Mains	\$	78,881		
Services		7,255	Load (Mcf)	1,300
Meters		0		
Marginal Capital		0	Net Revenue	\$ 25,771 annual
Total	\$	86,136		
O & M costs	\$	1,829 annual		
Property Tax Rate	\$	16.35 per thousand		

Results Summary

15 Yrs.
16.07%
\$41,306
\$0

- * IRR
- * NPV
- * Customer Contribution

Year	Investment	Revenue	O&M	Property Tax	Profit Before Taxes	Depreciation 20 Year Class	Income Taxes	Total Net Income	Total Net Cash Flow (\$86,136)	P.V. OF Cash Flow (\$86,136)	Payback Calculation (\$86,136)	Payback Period
1	\$86,136	\$25,771	\$1,829	\$1,408	\$22,534	\$3,230	\$7,573	\$11,731	\$14,961	13,774	(\$72,362)	1
2		25,771	1,829	1,408	22,534	6,218	6,401	9,915	16,133	13,674	(\$58,688)	2
3		25,771	1,829	1,408	22,534	5,751	6,584	10,199	15,950	12,446	(\$46,242)	3
4		25,771	1,829	1,408	22,534	5,321	6,753	10,461	15,781	11,337	(\$34,905)	4
5		25,771	1,829	1,408	22,534	4,921	6,910	10,703	15,624	10,334	(\$24,571)	5
6		25,771	1,829	1,408	22,534	4,552	7,054	10,927	15,480	9,426	(\$15,146)	6
7		25,771	1,829	1,408	22,534	4,210	7,188	11,135	15,346	8,602	(\$6,543)	7
8		25,771	1,829	1,408	22,534	3,895	7,312	11,327	15,222	7,856	1,313	8
9		25,771	1,829	1,408	22,534	3,843	7,332	11,358	15,202	7,223	8,535	9
10		25,771	1,829	1,408	22,534	3,843	7,333	11,359	15,201	6,649	15,185	10
11		25,771	1,829	1,408	22,534	3,843	7,332	11,358	15,202	6,122	21,367	11
12		25,771	1,829	1,408	22,534	3,843	7,333	11,359	15,201	5,636	26,943	12
13		25,771	1,829	1,408	22,534	3,843	7,332	11,358	15,202	5,189	32,131	13
14		25,771	1,829	1,408	22,534	3,843	7,333	11,359	15,201	4,777	36,908	14
15		25,771	1,829	1,408	22,534	3,843	7,332	11,358	15,202	4,398	41,306	15
16		25,771	1,829	1,408	22,534	3,843	7,333	11,359	15,201	4,049	45,355	16
17		25,771	1,829	1,408	22,534	3,843	7,332	11,358	15,202	3,728	49,082	17
18		25,771	1,829	1,408	22,534	3,843	7,333	11,359	15,201	3,432	52,514	18
19		25,771	1,829	1,408	22,534	3,843	7,332	11,358	15,202	3,159	55,674	19
20		25,771	1,829	1,408	22,534	3,843	7,333	11,359	15,201	2,909	58,582	20
21		25,771	1,829	1,408	22,534	1,922	8,086	12,526	14,448	2,545	61,127	21
22		25,771	1,829	1,408	22,534	0	8,840	13,694	13,694	2,221	63,348	22
23		25,771	1,829	1,408	22,534	0	8,840	13,694	13,694	2,045	65,393	23
24		25,771	1,829	1,408	22,534	0	8,840	13,694	13,694	1,882	67,275	24
25		25,771	1,829	1,408	22,534	0	8,840	13,694	13,694	1,733	69,008	25
26		25,771	1,829	1,408	22,534	0	8,840	13,694	13,694	1,595	70,603	26
27		25,771	1,829	1,408	22,534	0	8,840	13,694	13,694	1,469	72,072	27
28		25,771	1,829	1,408	22,534	0	8,840	13,694	13,694	1,352	73,424	28
29		25,771	1,829	1,408	22,534	0	8,840	13,694	13,694	1,245	74,669	29
30		25,771	1,829	1,408	22,534	0	8,840	13,694	13,694	1,146	75,815	30
31		25,771	1,829	1,408	22,534	0	8,840	13,694	13,694	1,055	76,870	31
32		25,771	1,829	1,408	22,534	0	8,840	13,694	13,694	971	77,842	32
33		25,771	1,829	1,408	22,534	0	8,840	13,694	13,694	894	78,736	33
34		25,771	1,829	1,408	22,534	0	8,840	13,694	13,694	823	79,560	34
35		25,771	1,829	1,408	22,534	0	8,840	13,694	13,694	758	80,318	35
36		25,771	1,829	1,408	22,534	0	8,840	13,694	13,694	698	81,016	36
37		25,771	1,829	1,408	22,534	0	8,840	13,694	13,694	642	81,658	37
38		25,771	1,829	1,408	22,534	0	8,840	13,694	13,694	592	82,250	38
39		25,771	1,829	1,408	22,534	0	8,840	13,694	13,694	545	82,794	39
40		25,771	1,829	1,408	22,534	0	8,840	13,694	13,694	501	83,295	40
41		25,771	1,829	1,408	22,534	0	8,840	13,694	13,694	462	83,757	41
42		25,771	1,829	1,408	22,534	0	8,840	13,694	13,694	425	84,182	42
43		25,771	1,829	1,408	22,534	0	8,840	13,694	13,694	391	84,573	43
44		25,771	1,829	1,408	22,534	0	8,840	13,694	13,694	360	84,933	44
45		25,771	1,829	1,408	22,534	0	8,840	13,694	13,694	332	85,265	45
46		25,771	1,829	1,408	22,534	0	8,840	13,694	13,694	305	85,570	46
47		25,771	1,829	1,408	22,534	0	8,840	13,694	13,694	281	85,851	47
48		25,771	1,829	1,408	22,534	0	8,840	13,694	13,694	259	86,110	48
49		25,771	1,829	1,408	22,534	0	8,840	13,694	13,694	238	86,348	49
50		25,771	1,829	1,408	22,534	0	8,840	13,694	13,694	219	86,567	50
51		25,771	1,829	1,408	22,534	0	8,840	13,694	13,694	202	86,769	51
52		25,771	1,829	1,408	22,534	0	8,840	13,694	13,694	186	86,955	52
53		25,771	1,829	1,408	22,534	0	8,840	13,694	13,694	171	87,126	53
54		25,771	1,829	1,408	22,534	0	8,840	13,694	13,694	158	87,284	54
55		25,771	1,829	1,408	22,534	0	8,840	13,694	13,694	145	87,429	55
56		25,771	1,829	1,408	22,534	0	8,840	13,694	(72,442)	(706)	86,722	56
Total	86,136	1,443,176	102,424	78,848	1,261,904	86,136	461,254	714,514	628,378	86,722	2,972,758	

195 D0023

BAY STATE GAS. CO. MAIN ORDER

Bay State Gas Company

DIVISION: MA(04) AUTH. NO. 2- RATE OF RETURN 21.30%
 DESCRIPTION/COMMENTS: This authorization provides for the installation of 2720' of 6" PE(HP)
 on Prescott St. and Osgood St., N. Andover MA. It also provides for the installation of 4000' of 4" PE
 (Builder Policy) to Edgewood Life Care from the proposed 6" PE on Osgood St.
 This main extension will serve 9 commercial buildings at Edgewood Life Care. PRE-CONSTRUCTION
 R.O.R. = 21.30% IRR

DOWNTOWN SUBURBS X BUILDER POLICY CUST. CONTR. \$

COST RECORD	SOURCE	BUDGET	ACTUAL	VARIANCE	START DATE
MATERIAL		\$11,400			COMP DATE
LABOR		\$20,000			ESTIMATOR
CONTR.		\$29,948			PROG/NOM
OVERHEAD		\$13,741			COMPLETE YES / NO
TOTAL		\$75,089			SUPPLEMENT YES / NO

	STREET & TOWN	SIZE	TYPE	EST	FINAL	ACCOUNT NUMBER	DIST %	COST PER FOOT
1	Prescott St., N. Andover MA	6"	PE	400'		383 197		
2	Osgood St., N. Andover MA	6"	PE	2320'		383 200		
3	Off-Osgood St., N. Andover	4"	PE	4000'		383 348		
4								
5				6720				
6								

	PIPE RETIRED	SIZE	TYPE	EST	FINAL	ACCOUNT NUMBER	INST YR	COST PER FOOT
1								
2								
3								
4								
5								
6								

"X" ALL THAT APPLY

EXTENSION	X	GROWTH	X
REPLACEMENT		BUILDER POLICY	X
MUNICIPAL IMP.		CONTRIBUTION	
SYSTEM IMP.		CO. LABOR	X
NO. OF SERVICES	9	SPECIAL CREWS	X
RATE OF RETURN	21.3	RESIDENTIAL	
BUDGETED		COMM. INDUST.	X
SPECIAL PROJECT		PRESSURE	H

APPROVAL: UNDER \$25K

DEPT. MGR

DIV. ENG. 2

DIV. MGR. 12-4

APPROVAL: OVER \$25K

CORP. MARKET

SR. V.P. OPER. 12/4/95

CORP. C.F.O. @ 12/4

FV 12/18/95

ATTACHMENT RR-DTE-136 (b)

Revenue Producing Plants Additions
Account 367 (Mains) > \$50K and < \$100K

List No. 12 (on DTE-3-27 Revised)

POST CONSTRUCTION - RATE OF RETURN ESTIMATE

WORKPAPER

Project: Coca Cola Plant
Northampton

Total Capital and O&M Costs

Meter Counts, Mcf Load and Net Revenue

Capital			Meter Counts	1
Mains	\$	112,325		
Services		14,657	Load (Mcf)	137,143
Meters		0		
Marginal Capital		0	Net Revenue	\$ 129,727 annual
Total	\$	126,982		

O & M costs \$ 9,755 annual

Property Tax Rate \$ 15.05 per thousand

POST-CONSTRUCTION

Results Summary	
* IRR	15 Yrs. 58.58%
* NPV	\$485,977
* Customer Contribution	\$0

Year	Investment	Revenue	O&M	Property Tax	Profit Before Taxes	Depreciation 20 Year Class	Income Taxes	Total Net Income	Total Net Cash Flow (\$126,982)	P.V. OF Cash Flow (\$126,982)	Payback Calculation (\$126,982)	Payback Period
1	\$126,982	\$129,727	\$9,755	\$1,911	\$118,061	\$4,762	\$44,447	\$68,852	\$73,614	67,772	(\$59,210)	1
2		129,727	9,755	1,911	118,061	9,167	42,719	66,175	75,342	63,858	4,648	2
3		129,727	9,755	1,911	118,061	8,479	42,989	66,593	75,072	58,580	63,228	3
4		129,727	9,755	1,911	118,061	7,844	43,238	66,979	74,823	53,752	116,980	4
5		129,727	9,755	1,911	118,061	7,254	43,469	67,337	74,592	49,333	166,313	5
6		129,727	9,755	1,911	118,061	6,711	43,683	67,667	74,378	45,389	211,602	6
7		129,727	9,755	1,911	118,061	6,207	43,880	67,974	74,181	41,584	253,185	7
8		129,727	9,755	1,911	118,061	5,742	44,063	68,256	73,998	38,189	291,373	8
9		129,727	9,755	1,911	118,061	5,666	44,093	68,302	73,968	35,145	326,519	9
10		129,727	9,755	1,911	118,061	5,665	44,093	68,303	73,968	32,355	358,874	10
11		129,727	9,755	1,911	118,061	5,666	44,093	68,302	73,968	29,788	388,662	11
12		129,727	9,755	1,911	118,061	5,665	44,093	68,303	73,968	27,424	416,086	12
13		129,727	9,755	1,911	118,061	5,666	44,093	68,302	73,968	25,248	441,334	13
14		129,727	9,755	1,911	118,061	5,665	44,093	68,303	73,968	23,244	464,577	14
15		129,727	9,755	1,911	118,061	5,666	44,093	68,302	73,968	21,399	485,977	15
16		129,727	9,755	1,911	118,061	5,665	44,093	68,303	73,968	19,701	505,677	16
17		129,727	9,755	1,911	118,061	5,666	44,093	68,302	73,968	18,138	523,815	17
18		129,727	9,755	1,911	118,061	5,665	44,093	68,303	73,968	16,698	540,513	18
19		129,727	9,755	1,911	118,061	5,666	44,093	68,302	73,968	15,373	555,886	19
20		129,727	9,755	1,911	118,061	5,665	44,093	68,303	73,968	14,153	570,039	20
21		129,727	9,755	1,911	118,061	2,833	45,204	70,024	72,857	12,834	582,873	21
22		129,727	9,755	1,911	118,061	0	46,315	71,746	71,746	11,635	594,509	22
23		129,727	9,755	1,911	118,061	0	46,315	71,746	71,746	10,712	605,221	23
24		129,727	9,755	1,911	118,061	0	46,315	71,746	71,746	9,862	615,083	24
25		129,727	9,755	1,911	118,061	0	46,315	71,746	71,746	9,079	624,162	25
26		129,727	9,755	1,911	118,061	0	46,315	71,746	71,746	8,359	632,521	26
27		129,727	9,755	1,911	118,061	0	46,315	71,746	71,746	7,695	640,216	27
28		129,727	9,755	1,911	118,061	0	46,315	71,746	71,746	7,085	647,301	28
29		129,727	9,755	1,911	118,061	0	46,315	71,746	71,746	6,522	653,823	29
30		129,727	9,755	1,911	118,061	0	46,315	71,746	71,746	6,005	659,828	30
31		129,727	9,755	1,911	118,061	0	46,315	71,746	71,746	5,528	665,356	31
32		129,727	9,755	1,911	118,061	0	46,315	71,746	71,746	5,090	670,446	32
33		129,727	9,755	1,911	118,061	0	46,315	71,746	71,746	4,686	675,132	33
34		129,727	9,755	1,911	118,061	0	46,315	71,746	71,746	4,314	679,445	34
35		129,727	9,755	1,911	118,061	0	46,315	71,746	71,746	3,971	683,417	35
36		129,727	9,755	1,911	118,061	0	46,315	71,746	71,746	3,656	687,073	36
37		129,727	9,755	1,911	118,061	0	46,315	71,746	71,746	3,366	690,439	37
38		129,727	9,755	1,911	118,061	0	46,315	71,746	71,746	3,099	693,538	38
39		129,727	9,755	1,911	118,061	0	46,315	71,746	71,746	2,853	696,391	39
40		129,727	9,755	1,911	118,061	0	46,315	71,746	71,746	2,627	699,018	40
41		129,727	9,755	1,911	118,061	0	46,315	71,746	71,746	2,418	701,436	41
42		129,727	9,755	1,911	118,061	0	46,315	71,746	71,746	2,226	703,663	42
43		129,727	9,755	1,911	118,061	0	46,315	71,746	71,746	2,050	705,712	43
44		129,727	9,755	1,911	118,061	0	46,315	71,746	71,746	1,887	707,599	44
45		129,727	9,755	1,911	118,061	0	46,315	71,746	71,746	1,737	709,336	45
46		129,727	9,755	1,911	118,061	0	46,315	71,746	71,746	1,599	710,936	46
47		129,727	9,755	1,911	118,061	0	46,315	71,746	71,746	1,472	712,408	47
48		129,727	9,755	1,911	118,061	0	46,315	71,746	71,746	1,356	713,764	48
49		129,727	9,755	1,911	118,061	0	46,315	71,746	71,746	1,248	715,012	49
50		129,727	9,755	1,911	118,061	0	46,315	71,746	71,746	1,149	716,161	50
51		129,727	9,755	1,911	118,061	0	46,315	71,746	71,746	1,058	717,219	51
52		129,727	9,755	1,911	118,061	0	46,315	71,746	71,746	974	718,192	52
53		129,727	9,755	1,911	118,061	0	46,315	71,746	71,746	897	719,089	53
54		129,727	9,755	1,911	118,061	0	46,315	71,746	71,746	825	719,914	54
55		129,727	9,755	1,911	118,061	0	46,315	71,746	71,746	760	720,674	55
56		129,727	9,755	1,911	118,061	0	46,315	71,746	(55,236)	(539)	720,136	56
Total	126,982	7,264,712	546,280	107,016	6,611,416	126,982	2,543,843	3,940,591	3,813,609	720,136	31,006,141	

Proj ID # S95D1006

February 6, 1995

BAY STATE GAS CO. MAIN ORDER

Bay State Gas Company

DIVISION Springfield AUTH. NO:2- MNECC RATE OF RETURN 47.37% D.T.E. 05-27

DESCRIPTION / COMMENTS: Install 4830' of 6" IP main on various streets in Northampton from King St. to cover the Coca Cola plant.

PRE-CONSTRUCTION
IRR

DOWNTOWN _____ SUBURBS X BUILDER POLICY _____ CUST. CONTR. \$ _____

COST RECORD	SOURCE	BUDGET	ACTUAL	VARIANCE	START DATE	COMP. DATE	ESTIMATOR TD	PROG NO./ NOMAD	COMPLETE	SUPPLEMENT
MATERIAL		27870			/ / 1995	9/5/1995				
LABOR		47100								
CONTRACTOR										
OVERHEAD										
TOTAL		74970								

PIPE INSTALLED: FROM: King St. TO: service to Coca Cola

	STREET NAME & TOWN	SIZE	TYPE	FOOTAGE EST. FINAL	ACCOUNT NUMBER	DIST %	COST PER FT
1	North St. - Northampton	6"	PP	1530 1493	✓ W04304290-1		\$28,458
2	Woodmont St. - Northampton	6"	PP	1400 899	✓ W04304296-1		\$5,644
3	Bradford St. - Northampton	6"	PP	1400 18108	✓ W04304300-1		\$21,307
4	Industrial Dr. - Northampton	6"	PP	500 542	✓ W04304303-1		\$49,997
5							

	PIPE RETIRED	SIZE	TYPE	FOOTAGE EST. FINAL	ACCOUNT NUMBER	INST. YR.	COST PER FT
1							
2							
3							
4							
5							

TYPE: 'X' OFF ALL WHICH APPLY

EXTENSION	<input checked="" type="checkbox"/>	GROWTH	<input checked="" type="checkbox"/>
REPLACEMENT	<input type="checkbox"/>	BUILDER POLICY	<input type="checkbox"/>
MUNICIPAL IMP.	<input type="checkbox"/>	CONTRIBUTION	<input type="checkbox"/>
SYSTEM IMP.	<input type="checkbox"/>	CO. LABOR	<input type="checkbox"/>
NO. OF SERVICES	<input type="checkbox"/>	SPECIAL CREWS	<input type="checkbox"/>
RATE OF RETURN	<input checked="" type="checkbox"/>	RESIDENTIAL	<input type="checkbox"/>
BUDGETED	<input type="checkbox"/>	COMM. INDUST.	<input checked="" type="checkbox"/>
PERMIT RECEIVED	<input type="checkbox"/>	PRESSURE	<input checked="" type="checkbox"/>

ACCOUNTING INFO CLOSE TO PLANT

Mylan 95/100

APPROVAL: UNDER \$25K

DEPT. MGR. JDD

DIV. ENG. JDD

DIV. MGR. JDD

APPROVAL: OVER \$25K

CORP. MARKET

SR. V.P. OPER.

CORP. C.F.O.

95-7

ATTACHMENT RR-DTE-136 (b)

Revenue Producing Plants Additions
Account 367 (Mains) > \$50K and < \$100K

List No. 13 (on DTE-3-27 Revised)

POST CONSTRUCTION - RATE OF RETURN ESTIMATE

WORKPAPER

Project: Mount Dumping Road
Palmer

Total Capital and O&M Costs

Meter Counts, Mcf Load and Net Revenue

Capital			Meter Counts	41
Mains	\$	68,755		
Services		24,207	Load (Mcf)	4,879
Meters		0		
Marginal Capital		0	Net Revenue	\$
Total	\$	92,962		17,436 annual
O & M costs	\$	6,697 annual		
Property Tax Rate	\$	19.25 per thousand		

Results Summary

	55 Yrs.
* IRR	7.24%
* NPV	(\$12,857)
* Customer Contribution	\$21,157

Year	Investment	Revenue	O&M	Property Tax	Profit Before Taxes	Depreciation 20 Year Class	Income Taxes	Total Net Income	Total Net Cash Flow (\$92,962)	P.V. OF Cash Flow (\$92,962)	Payback Calculation (\$92,962)	Payback Period
1	\$92,962	\$17,436	\$6,697	\$1,790	\$8,949	\$3,486	\$2,143	\$3,320	\$6,806	6,266	(\$86,696)	1
2		17,436	6,697	1,790	8,949	6,711	878	1,360	8,071	6,841	(79,855)	2
3		17,436	6,697	1,790	8,949	6,207	1,076	1,666	7,873	6,144	(73,712)	3
4		17,436	6,697	1,790	8,949	5,742	1,258	1,949	7,691	5,525	(68,187)	4
5		17,436	6,697	1,790	8,949	5,311	1,427	2,211	7,522	4,975	(63,212)	5
6		17,436	6,697	1,790	8,949	4,913	1,583	2,453	7,366	4,485	(58,727)	6
7		17,436	6,697	1,790	8,949	4,544	1,728	2,677	7,221	4,048	(54,679)	7
8		17,436	6,697	1,790	8,949	4,204	1,862	2,884	7,087	3,658	(51,021)	8
9		17,436	6,697	1,790	8,949	4,148	1,883	2,918	7,066	3,357	(47,664)	9
10		17,436	6,697	1,790	8,949	4,147	1,884	2,918	7,065	3,090	(44,574)	10
11		17,436	6,697	1,790	8,949	4,148	1,883	2,918	7,066	2,845	(41,728)	11
12		17,436	6,697	1,790	8,949	4,147	1,884	2,918	7,065	2,619	(39,109)	12
13		17,436	6,697	1,790	8,949	4,148	1,883	2,918	7,066	2,412	(36,697)	13
14		17,436	6,697	1,790	8,949	4,147	1,884	2,918	7,065	2,220	(34,477)	14
15		17,436	6,697	1,790	8,949	4,148	1,883	2,918	7,066	2,044	(32,433)	15
16		17,436	6,697	1,790	8,949	4,147	1,884	2,918	7,065	1,882	(30,551)	16
17		17,436	6,697	1,790	8,949	4,148	1,883	2,918	7,066	1,733	(28,819)	17
18		17,436	6,697	1,790	8,949	4,147	1,884	2,918	7,065	1,595	(27,224)	18
19		17,436	6,697	1,790	8,949	4,148	1,883	2,918	7,066	1,468	(25,755)	19
20		17,436	6,697	1,790	8,949	4,147	1,884	2,918	7,065	1,352	(24,404)	20
21		17,436	6,697	1,790	8,949	2,074	2,697	4,178	6,252	1,101	(23,302)	21
22		17,436	6,697	1,790	8,949	0	3,511	5,438	5,438	882	(22,420)	22
23		17,436	6,697	1,790	8,949	0	3,511	5,438	5,438	812	(21,608)	23
24		17,436	6,697	1,790	8,949	0	3,511	5,438	5,438	748	(20,861)	24
25		17,436	6,697	1,790	8,949	0	3,511	5,438	5,438	688	(20,173)	25
26		17,436	6,697	1,790	8,949	0	3,511	5,438	5,438	634	(19,539)	26
27		17,436	6,697	1,790	8,949	0	3,511	5,438	5,438	583	(18,956)	27
28		17,436	6,697	1,790	8,949	0	3,511	5,438	5,438	537	(18,419)	28
29		17,436	6,697	1,790	8,949	0	3,511	5,438	5,438	494	(17,924)	29
30		17,436	6,697	1,790	8,949	0	3,511	5,438	5,438	455	(17,469)	30
31		17,436	6,697	1,790	8,949	0	3,511	5,438	5,438	419	(17,050)	31
32		17,436	6,697	1,790	8,949	0	3,511	5,438	5,438	386	(16,664)	32
33		17,436	6,697	1,790	8,949	0	3,511	5,438	5,438	355	(16,309)	33
34		17,436	6,697	1,790	8,949	0	3,511	5,438	5,438	327	(15,982)	34
35		17,436	6,697	1,790	8,949	0	3,511	5,438	5,438	301	(15,681)	35
36		17,436	6,697	1,790	8,949	0	3,511	5,438	5,438	277	(15,404)	36
37		17,436	6,697	1,790	8,949	0	3,511	5,438	5,438	255	(15,149)	37
38		17,436	6,697	1,790	8,949	0	3,511	5,438	5,438	235	(14,914)	38
39		17,436	6,697	1,790	8,949	0	3,511	5,438	5,438	216	(14,698)	39
40		17,436	6,697	1,790	8,949	0	3,511	5,438	5,438	199	(14,498)	40
41		17,436	6,697	1,790	8,949	0	3,511	5,438	5,438	183	(14,315)	41
42		17,436	6,697	1,790	8,949	0	3,511	5,438	5,438	169	(14,146)	42
43		17,436	6,697	1,790	8,949	0	3,511	5,438	5,438	155	(13,991)	43
44		17,436	6,697	1,790	8,949	0	3,511	5,438	5,438	143	(13,848)	44
45		17,436	6,697	1,790	8,949	0	3,511	5,438	5,438	132	(13,716)	45
46		17,436	6,697	1,790	8,949	0	3,511	5,438	5,438	121	(13,595)	46
47		17,436	6,697	1,790	8,949	0	3,511	5,438	5,438	112	(13,483)	47
48		17,436	6,697	1,790	8,949	0	3,511	5,438	5,438	103	(13,381)	48
49		17,436	6,697	1,790	8,949	0	3,511	5,438	5,438	95	(13,286)	49
50		17,436	6,697	1,790	8,949	0	3,511	5,438	5,438	87	(13,199)	50
51		17,436	6,697	1,790	8,949	0	3,511	5,438	5,438	80	(13,119)	51
52		17,436	6,697	1,790	8,949	0	3,511	5,438	5,438	74	(13,045)	52
53		17,436	6,697	1,790	8,949	0	3,511	5,438	5,438	68	(12,977)	53
54		17,436	6,697	1,790	8,949	0	3,511	5,438	5,438	63	(12,915)	54
55		17,436	6,697	1,790	8,949	0	3,511	5,438	5,438	58	(12,857)	55
56		17,436	6,697	1,790	8,949	0	3,511	5,438	(87,524)	(853)	(13,710)	56
Total	92,962	976,416	375,032	100,240	501,144	92,962	160,130	248,052	155,090	(13,710)	(1,615,090)	

Sept. 19, 1995

BAY STATE GAS CO. MAIN ORDER

Bay State Gas Company
D.T.E. 05-27
Attachment R-DTE-136(b)
Page 46 of 62

DIVISION Springfield AUTH. NO:2- MNNRB

RATE OF RETURN Attachment R-DTE-136(b)

DESCRIPTION / COMMENTS: Mt. Dumpling Road - Palmer

call 1600' of 4" and 2000' of 2" IP main to provide service to a condominium complex with 51 units. This project has been evaluated by marketing over a 3 year period.

PRE-CONSTRUCTION
IRR

* This project has been reviewed by Paul Reinhardt.

DOWNTOWN _____ SUBURBS X BUILDER POLICY _____ CUST. CONTR. \$ _____

COST RECORD

MATERIAL

LABOR

CONTRACTOR

OVERHEAD

TOTAL

SOURCE	BUDGET	ACTUAL	VARIANCE
	6455		
	27200		
	30204		
	63859		

START DATE / / 1995

COMP. DATE / /

ESTIMATOR CD

PROG NO. / NOMAD

COMPLETE

SUPPLEMENT

Y	N
Y	N

PIPE INSTALLED: FROM: Inter. of Desimone Dr. TO: Meadowbrook Green condos

	STREET NAME & TOWN	SIZE	TYPE	FOOTAGE EST. FINAL	ACCOUNT NUMBER	DIST %	COST PER FT
1	Mt. Dumpling Rd. - Palmer	4"	PP	1600		100%	\$38.45
2	Meadowbrook Green condos - Palmer	2"	PP	2000			\$3.48
3	(private prop.)						\$4.048
4							\$2.499
5							\$3.569
6							\$1.379

	PIPE RETIRED	SIZE	TYPE	FOOTAGE EST. FINAL	ACCOUNT NUMBER	INST. YR.	COST PER FT
1							\$2.800
2							
3							
4							
5							

TYPE: 'X' OFF ALL WHICH APPLY

EXTENSION

REPLACEMENT

MUNICIPAL IMP.

SYSTEM IMP.

NO. OF SERVICES

RATE OF RETURN

BUDGETED

PERMIT RECEIVED

X
39
X

GROWTH

BUILDER POLICY

CONTRIBUTION

CO. LABOR

SPECIAL CREWS

RESIDENTIAL

COMM. INDUST.

PRESSURE

X
X
X
IP

APPROVAL: UNDER \$25K

DEPT. MGR.

DIV. ENG.

DIV. MGR.

APPROVAL: OVER \$25K

CORP. MARKET

SUPERV. OPER.

CORP. C.F.O.

APC 10/10

Mark P. GAB
Paul J. Sinto 9/24/95
Joe 10/10/95

ACCOUNTING INFO CLOSE TO PLANT

ATTACHMENT RR-DTE-136 (b)

Revenue Producing Plants Additions
Account 367 (Mains) > \$50K and < \$100K

List No. 14 (on DTE-3-27 Revised)

POST CONSTRUCTION - RATE OF RETURN ESTIMATE

WORKPAPER

Project: Thyme Street
Springfield

Total Capital and O&M Costs

Meter Counts, Mcf Load and Net Revenue

Capital			Meter Counts	59
Mains	\$	104,933		
Services		85,438	Load (Mcf)	7,021
Meters		0		
Marginal Capital		0	Net Revenue	\$ 25,090 annual
Total	\$	190,371		
O & M costs	\$	9,636 annual		
Property Tax Rate	\$	36.84 per thousand		

Results Summary	
55 Yrs.	
* IRR	3.10%
* NPV	(\$95,180)
* Customer Contribution	\$156,787

Year	Investment	Revenue	O&M	Property Tax	Profit Before Taxes	Depreciation 20 Year Class	Income Taxes	Total Net Income	Total Net Cash Flow (\$190,371)	P.V. OF Cash Flow (\$190,371)	Payback Calculation (\$190,371)	Payback Period
1	\$190,371	\$25,090	\$9,636	\$7,013	\$8,441	\$7,139	\$511	\$791	\$7,930	7,301	(\$183,070)	1
2		25,090	9,636	7,013	8,441	13,743	(2,080)	(3,222)	10,521	8,917	(174,153)	2
3		25,090	9,636	7,013	8,441	12,711	(1,675)	(2,595)	10,116	7,894	(166,259)	3
4		25,090	9,636	7,013	8,441	11,759	(1,302)	(2,016)	9,743	6,999	(159,260)	4
5		25,090	9,636	7,013	8,441	10,876	(955)	(1,480)	9,396	6,214	(153,045)	5
6		25,090	9,636	7,013	8,441	10,061	(636)	(985)	9,077	5,527	(147,519)	6
7		25,090	9,636	7,013	8,441	9,305	(339)	(525)	8,780	4,922	(142,597)	7
8		25,090	9,636	7,013	8,441	8,609	(66)	(102)	8,507	4,390	(138,207)	8
9		25,090	9,636	7,013	8,441	8,494	(21)	(32)	8,462	4,021	(134,186)	9
10		25,090	9,636	7,013	8,441	8,492	(20)	(31)	8,461	3,701	(130,485)	10
11		25,090	9,636	7,013	8,441	8,494	(21)	(32)	8,462	3,408	(127,077)	11
12		25,090	9,636	7,013	8,441	8,492	(20)	(31)	8,461	3,137	(123,940)	12
13		25,090	9,636	7,013	8,441	8,494	(21)	(32)	8,462	2,888	(121,052)	13
14		25,090	9,636	7,013	8,441	8,492	(20)	(31)	8,461	2,659	(118,393)	14
15		25,090	9,636	7,013	8,441	8,494	(21)	(32)	8,462	2,448	(115,945)	15
16		25,090	9,636	7,013	8,441	8,492	(20)	(31)	8,461	2,254	(113,692)	16
17		25,090	9,636	7,013	8,441	8,494	(21)	(32)	8,462	2,075	(111,617)	17
18		25,090	9,636	7,013	8,441	8,492	(20)	(31)	8,461	1,910	(109,707)	18
19		25,090	9,636	7,013	8,441	8,494	(21)	(32)	8,462	1,759	(107,948)	19
20		25,090	9,636	7,013	8,441	8,492	(20)	(31)	8,461	1,619	(106,329)	20
21		25,090	9,636	7,013	8,441	4,247	1,645	2,549	6,796	1,197	(105,132)	21
22		25,090	9,636	7,013	8,441	0	3,311	5,130	5,130	832	(104,300)	22
23		25,090	9,636	7,013	8,441	0	3,311	5,130	5,130	766	(103,534)	23
24		25,090	9,636	7,013	8,441	0	3,311	5,130	5,130	705	(102,829)	24
25		25,090	9,636	7,013	8,441	0	3,311	5,130	5,130	649	(102,180)	25
26		25,090	9,636	7,013	8,441	0	3,311	5,130	5,130	598	(101,582)	26
27		25,090	9,636	7,013	8,441	0	3,311	5,130	5,130	550	(101,032)	27
28		25,090	9,636	7,013	8,441	0	3,311	5,130	5,130	507	(100,526)	28
29		25,090	9,636	7,013	8,441	0	3,311	5,130	5,130	466	(100,059)	29
30		25,090	9,636	7,013	8,441	0	3,311	5,130	5,130	429	(99,630)	30
31		25,090	9,636	7,013	8,441	0	3,311	5,130	5,130	395	(99,235)	31
32		25,090	9,636	7,013	8,441	0	3,311	5,130	5,130	364	(98,871)	32
33		25,090	9,636	7,013	8,441	0	3,311	5,130	5,130	335	(98,536)	33
34		25,090	9,636	7,013	8,441	0	3,311	5,130	5,130	308	(98,227)	34
35		25,090	9,636	7,013	8,441	0	3,311	5,130	5,130	284	(97,943)	35
36		25,090	9,636	7,013	8,441	0	3,311	5,130	5,130	261	(97,682)	36
37		25,090	9,636	7,013	8,441	0	3,311	5,130	5,130	241	(97,441)	37
38		25,090	9,636	7,013	8,441	0	3,311	5,130	5,130	222	(97,220)	38
39		25,090	9,636	7,013	8,441	0	3,311	5,130	5,130	204	(97,016)	39
40		25,090	9,636	7,013	8,441	0	3,311	5,130	5,130	188	(96,828)	40
41		25,090	9,636	7,013	8,441	0	3,311	5,130	5,130	173	(96,655)	41
42		25,090	9,636	7,013	8,441	0	3,311	5,130	5,130	159	(96,496)	42
43		25,090	9,636	7,013	8,441	0	3,311	5,130	5,130	147	(96,349)	43
44		25,090	9,636	7,013	8,441	0	3,311	5,130	5,130	135	(96,214)	44
45		25,090	9,636	7,013	8,441	0	3,311	5,130	5,130	124	(96,090)	45
46		25,090	9,636	7,013	8,441	0	3,311	5,130	5,130	114	(95,976)	46
47		25,090	9,636	7,013	8,441	0	3,311	5,130	5,130	105	(95,871)	47
48		25,090	9,636	7,013	8,441	0	3,311	5,130	5,130	97	(95,774)	48
49		25,090	9,636	7,013	8,441	0	3,311	5,130	5,130	89	(95,684)	49
50		25,090	9,636	7,013	8,441	0	3,311	5,130	5,130	82	(95,602)	50
51		25,090	9,636	7,013	8,441	0	3,311	5,130	5,130	76	(95,527)	51
52		25,090	9,636	7,013	8,441	0	3,311	5,130	5,130	70	(95,457)	52
53		25,090	9,636	7,013	8,441	0	3,311	5,130	5,130	64	(95,393)	53
54		25,090	9,636	7,013	8,441	0	3,311	5,130	5,130	59	(95,334)	54
55		25,090	9,636	7,013	8,441	0	3,311	5,130	5,130	54	(95,280)	55
56		25,090	9,636	7,013	8,441	0	3,311	5,130	(185,241)	(1,806)	(97,086)	56
Total	190,371	1,405,040	539,616	392,728	472,696	190,371	110,756	171,569	(18,802)	(97,086)	(6,409,440)	

[illegible]

Rec 9/20/94

BAY STATE GAS CO. MAIN ORDER

Bay State Gas Company

D.T.E. 05-27

DIVISION Springfield AUTH. NO:2- MNERBRATE OF RETURN RR-DIG-136(b)

Page 50 of 62

DESCRIPTION / COMMENTS: Thyme St. - Springfield

Install 10,675' of 2" IP main to cover 215 existing homes. This is part of a system expansion project which has been approved by Paul Reinhardt. This project has been evaluated by sales & marketing over a three year period.

PRE-CONSTRUCTION

IRR

* SEE ATTACHED SHEETS

DOWNTOWN _____ SUBURBS X BUILDER POLICY _____ CUST. CONTR. \$ _____

COST RECORD	SOURCE	BUDGET	ACTUAL	VARIANCE
MATERIAL		11365		
LABOR		82775		
CONTRACTOR				
OVERHEAD				
TOTAL		94140		

START DATE / / 1994

COMP. DATE / /

ESTIMATOR MPK

PROG NO. / NOMAD

COMPLETE	Y	N
SUPPLEMENT	Y	N

PIPE INSTALLED: FROM: SEE ATTACHED MYLAR TO:

	STREET NAME & TOWN	SIZE	TYPE	FOOTAGE EST.	FINAL	ACCOUNT NUMBER	DIST	COST PER FT
1	Thyme St. - Springfield	2"	950	ENV	5432		Wot#	200162
2	Saffron Cir. - Springfield	2"	2165				Wot#	200163
3	Spikenard Cir. - Springfield	2"	3060				Wot#	200164
4	Peekskill Ave. - Springfield	2"	2500	ENV	5431		Wot#	200165
5	Portucala Dr. - Springfield	2"	1400				Wot#	200167
6	Lavender Ln. - Springfield	2"	800				Wot#	200168

	PIPE RETIRED	SIZE	TYPE	FOOTAGE EST.	FINAL	ACCOUNT NUMBER	INST. YR.	COST PER FT
1	Glen oak Rd	2"	200				Wot#	200169
2	Nutmeg Dr	1"	59				Wot#	202209
3	Shady Ln	1"	138				Wot#	204128
4	OLD La	1"	189				Wot#	204129
5								

TYPE: 'X' OFF ALL WHICH APPLY

EXTENSION	X	GROWTH	X
REPLACEMENT		BUILDER POLICY	
MUNICIPAL IMP.		CONTRIBUTION	
SYSTEM IMP.		CO. LABOR	X
NO. OF SERVICES	215	SPECIAL CREWS	
RATE OF RETURN	X	RESIDENTIAL	X
BUDGETED		COMM. INDUST.	
PERMIT RECEIVED	Ref	PRESSURE	IP

ACCOUNTING INFO CLOSE TO PLANT

L ENV # 5431 / 5432

APPROVAL: UNDER \$25K

DEPT. MGR.

DIV. ENG.

DIV. MGR.

APPROVAL: OVER \$25K

CORP. MARKET

SR. V.P. OPER.

CORP. C.F.O.

94-27

ATTACHMENT RR-DTE-136 (b)

Revenue Producing Plants Additions
Account 367 (Mains) > \$50K and < \$100K

List No. 15 (on DTE-3-27 Revised)

POST CONSTRUCTION - RATE OF RETURN ESTIMATE

WORKPAPER

Project: Tarkin Hill Estates
Bridgewater

Total Capital and O&M Costs

Meter Counts, Mcf Load and Net Revenue

Capital			Meter Counts	15
Mains	\$	81,281		
Services		11,461	Load (Mcf)	1,785
Meters		0		
Marginal Capital		0	Net Revenue	\$ 6,373 annual
Total	\$	92,742		

O & M costs \$ 2,450 annual

Property Tax Rate \$ 14.84 per thousand

Results Summary	
55 Yrs.	
* IRR	1.29%
* NPV	(\$57,334)
* Customer Contribution	\$94,346

Year	Investment	Revenue	O&M	Property Tax	Profit Before Taxes	Depreciation 20 Year Class	Income Taxes	Total Net Income	Total Net Cash Flow (\$92,742)	P.V. OF Cash Flow (\$92,742)	Payback Calculation (\$92,742)	Payback Period
1	\$92,742	\$6,373	\$2,450	\$1,376	\$2,547	\$3,478	(\$365)	(\$666)	\$2,912	2,681	(\$90,061)	1
2		6,373	2,450	1,376	2,547	6,695	(1,627)	(2,521)	4,174	3,538	(86,523)	2
3		6,373	2,450	1,376	2,547	6,192	(1,430)	(2,215)	3,977	3,103	(83,420)	3
4		6,373	2,450	1,376	2,547	5,729	(1,248)	(1,934)	3,795	2,726	(80,693)	4
5		6,373	2,450	1,376	2,547	5,298	(1,079)	(1,672)	3,626	2,398	(78,295)	5
6		6,373	2,450	1,376	2,547	4,901	(924)	(1,431)	3,471	2,113	(76,181)	6
7		6,373	2,450	1,376	2,547	4,533	(779)	(1,207)	3,326	1,865	(74,317)	7
8		6,373	2,450	1,376	2,547	4,194	(646)	(1,001)	3,193	1,648	(72,669)	8
9		6,373	2,450	1,376	2,547	4,138	(624)	(967)	3,171	1,507	(71,162)	9
10		6,373	2,450	1,376	2,547	4,137	(624)	(966)	3,171	1,387	(69,775)	10
11		6,373	2,450	1,376	2,547	4,138	(624)	(967)	3,171	1,277	(68,498)	11
12		6,373	2,450	1,376	2,547	4,137	(624)	(966)	3,171	1,176	(67,323)	12
13		6,373	2,450	1,376	2,547	4,138	(624)	(967)	3,171	1,082	(66,240)	13
14		6,373	2,450	1,376	2,547	4,137	(624)	(966)	3,171	996	(65,244)	14
15		6,373	2,450	1,376	2,547	4,138	(624)	(967)	3,171	917	(64,326)	15
16		6,373	2,450	1,376	2,547	4,137	(624)	(966)	3,171	845	(63,482)	16
17		6,373	2,450	1,376	2,547	4,138	(624)	(967)	3,171	778	(62,704)	17
18		6,373	2,450	1,376	2,547	4,137	(624)	(966)	3,171	716	(61,988)	18
19		6,373	2,450	1,376	2,547	4,138	(624)	(967)	3,171	659	(61,329)	19
20		6,373	2,450	1,376	2,547	4,137	(624)	(966)	3,171	607	(60,723)	20
21		6,373	2,450	1,376	2,547	2,069	187	290	2,360	416	(60,307)	21
22		6,373	2,450	1,376	2,547	0	999	1,548	1,548	251	(60,056)	22
23		6,373	2,450	1,376	2,547	0	999	1,548	1,548	231	(59,825)	23
24		6,373	2,450	1,376	2,547	0	999	1,548	1,548	213	(59,612)	24
25		6,373	2,450	1,376	2,547	0	999	1,548	1,548	196	(59,416)	25
26		6,373	2,450	1,376	2,547	0	999	1,548	1,548	180	(59,236)	26
27		6,373	2,450	1,376	2,547	0	999	1,548	1,548	166	(59,070)	27
28		6,373	2,450	1,376	2,547	0	999	1,548	1,548	153	(58,917)	28
29		6,373	2,450	1,376	2,547	0	999	1,548	1,548	141	(58,776)	29
30		6,373	2,450	1,376	2,547	0	999	1,548	1,548	130	(58,647)	30
31		6,373	2,450	1,376	2,547	0	999	1,548	1,548	119	(58,528)	31
32		6,373	2,450	1,376	2,547	0	999	1,548	1,548	110	(58,418)	32
33		6,373	2,450	1,376	2,547	0	999	1,548	1,548	101	(58,317)	33
34		6,373	2,450	1,376	2,547	0	999	1,548	1,548	93	(58,224)	34
35		6,373	2,450	1,376	2,547	0	999	1,548	1,548	86	(58,138)	35
36		6,373	2,450	1,376	2,547	0	999	1,548	1,548	79	(58,059)	36
37		6,373	2,450	1,376	2,547	0	999	1,548	1,548	73	(57,986)	37
38		6,373	2,450	1,376	2,547	0	999	1,548	1,548	67	(57,920)	38
39		6,373	2,450	1,376	2,547	0	999	1,548	1,548	62	(57,858)	39
40		6,373	2,450	1,376	2,547	0	999	1,548	1,548	57	(57,801)	40
41		6,373	2,450	1,376	2,547	0	999	1,548	1,548	52	(57,749)	41
42		6,373	2,450	1,376	2,547	0	999	1,548	1,548	48	(57,701)	42
43		6,373	2,450	1,376	2,547	0	999	1,548	1,548	44	(57,657)	43
44		6,373	2,450	1,376	2,547	0	999	1,548	1,548	41	(57,616)	44
45		6,373	2,450	1,376	2,547	0	999	1,548	1,548	37	(57,579)	45
46		6,373	2,450	1,376	2,547	0	999	1,548	1,548	35	(57,544)	46
47		6,373	2,450	1,376	2,547	0	999	1,548	1,548	32	(57,512)	47
48		6,373	2,450	1,376	2,547	0	999	1,548	1,548	29	(57,483)	48
49		6,373	2,450	1,376	2,547	0	999	1,548	1,548	27	(57,456)	49
50		6,373	2,450	1,376	2,547	0	999	1,548	1,548	25	(57,431)	50
51		6,373	2,450	1,376	2,547	0	999	1,548	1,548	23	(57,409)	51
52		6,373	2,450	1,376	2,547	0	999	1,548	1,548	21	(57,388)	52
53		6,373	2,450	1,376	2,547	0	999	1,548	1,548	19	(57,368)	53
54		6,373	2,450	1,376	2,547	0	999	1,548	1,548	18	(57,350)	54
55		6,373	2,450	1,376	2,547	0	999	1,548	1,548	16	(57,334)	55
56		6,373	2,450	1,376	2,547	0	999	1,548	(91,194)	(889)	(58,223)	56
Total	92,742	356,888	137,200	77,056	142,632	92,742	19,572	30,318	(62,424)	(58,223)	(3,613,607)	

BAY STATE GAS CO. MAIN ORDER

Bay State Gas Company
D.T.E. 05-27
Attachment RR-DTE-136(b)
ROR 8.61% Page 53 of 62

DIVISION BROCKTON WORK CODE MNNRC

DESCRIPTION/COMMENTS NEW MAIN:

**PRE-CONSTRUCTION
IRR**

This authorization reflects the estimated cost to provide natural gas
to 30 new customers.

B94D0068

* Tarkin Hill Estates

Builder to dig, backfill & sand within development

DOWNTOWN _____ SUBURBS X BUILDER POLICY X CUST. CONTR \$0

COST RECORD	SOURCE	BUDGET	ACTUAL	VARIANCE	START DATE	COMP. DATE	ESTIMATOR	PROJ/NOMAD	COMPLETE	SUPPLEMENT
MATERIAL		19,850.00			7-7-94	7-22-94	RG 4/14/94	4642	Y	N
LABOR		8,265.00							Y	N
CONTRACTOR		37,055.00								
OVERHEAD										
TOTAL		\$66,170.00								

PIPE INSTALLED: FROM: E.O.M. @ Hse #1026 South St TO: Pole #126
Opp. hse #1450 South St Lot #4

	STREET NAME & TOWN	SIZE	TYPE	ESTIMATE	FOOTAGE		ACCOUNT NUMBER	DIST. %	COST PER FT.
						ACTUAL			
1	South Street	Bridgewater	6.0	PP	3850	3803'	184942		
2	Tarkin Hill Road	Bridgewater	2.0	PP	725	730'	184943		
3									
4									
5									
6									

\$78.3
\$2,891

	PIPE RETIRED	SIZE	TYPE	ESTIMATE	FOOTAGE		ACCOUNT NUMBER	INST. YEAR	COST PER FT.
						ACTUAL			
1									
2									
3									
4									
5									
6									

EXTENSION	<u>X</u>	GROWTH	<u>X</u>
REPLACEMENT		BUILDER POLICY	<u>X</u>
MUNICIPAL IMP		CONTRIBUTION	
SYSTEM IMP		CO. LABOR	
NO. OF SERVICES	<u>30</u>	SPECIAL CREWS	
RATE OF RETURN	<u>X</u>	RESIDENTIAL	<u>X</u>
BUDGETED		COMM./INDUST.	
PERMIT RECEIVED		PRESSURE	<u>H</u>

(ACCOUNTING INFO) CLOSE TO PLANT

APPROVAL: UNDER 25K

DEPT. MGR.
DIV. ENG. Q A Keaton 5/10/94
DIV. MGR.

APPROVAL: OVER 25K

CORP. MARKET
SR. VP OPER.
CONTROLLER

ATTACHMENT RR-DTE-136 (b)

Revenue Producing Plants Additions
Account 367 (Mains) > \$50K and < \$100K

List No. 16 (on DTE-3-27 Revised)

POST CONSTRUCTION - RATE OF RETURN ESTIMATE

WORKPAPER

POST-CONSTRUCTION

Project: Streans Hill Estates
Mansfield

Total Capital and O&M Costs

Meter Counts, Mcf Load and Net Revenue

Capital			Meter Counts	191
Mains	\$	59,855		
Services		186,979	Load (Mcf)	24,066
Meters		0		
Marginal Capital		0	Net Revenue	\$ 83,680 annual
Total	\$	246,834		

O & M costs \$ 31,290 annual

Property Tax Rate \$ 18.20 per thousand

Results Summary

	55 Yrs.
* IRR	13.69%
* NPV	\$134,219
* Customer Contribution	\$0

Year	Investment	Revenue	O&M	Property Tax	Profit Before Taxes	Depreciation 20 Year Class	Income Taxes	Total Net Income	Total Net Cash Flow (\$246,834)	P V OF Cash Flow (\$246,834)	Payback Calculation (\$246,834)	Payback Period
1	\$246,834	\$83,680	\$31,290	\$4,492	\$47,898	\$9,256	\$15,159	\$23,483	\$32,739	30,141	(\$216,693)	1
2		83,680	31,290	4,492	47,898	17,819	11,800	18,279	36,098	30,596	(186,097)	2
3		83,680	31,290	4,492	47,898	16,481	12,325	19,092	35,573	27,758	(158,339)	3
4		83,680	31,290	4,492	47,898	15,247	12,809	19,842	35,089	25,208	(133,131)	4
5		83,680	31,290	4,492	47,898	14,102	13,258	20,538	34,640	22,910	(110,221)	5
6		83,680	31,290	4,492	47,898	13,045	13,673	21,180	34,225	20,840	(89,382)	6
7		83,680	31,290	4,492	47,898	12,065	14,057	21,776	33,841	18,970	(70,412)	7
8		83,680	31,290	4,492	47,898	11,162	14,412	22,325	33,486	17,282	(53,130)	8
9		83,680	31,290	4,492	47,898	11,014	14,470	22,415	33,428	15,883	(37,247)	9
10		83,680	31,290	4,492	47,898	11,011	14,471	22,416	33,427	14,622	(22,625)	10
11		83,680	31,290	4,492	47,898	11,014	14,470	22,415	33,428	13,462	(9,163)	11
12		83,680	31,290	4,492	47,898	11,011	14,471	22,416	33,427	12,393	3,230	12
13		83,680	31,290	4,492	47,898	11,014	14,470	22,415	33,428	11,410	14,640	13
14		83,680	31,290	4,492	47,898	11,011	14,471	22,416	33,427	10,504	25,144	14
15		83,680	31,290	4,492	47,898	11,014	14,470	22,415	33,428	9,671	34,815	15
16		83,680	31,290	4,492	47,898	11,011	14,471	22,416	33,427	8,903	43,718	16
17		83,680	31,290	4,492	47,898	11,014	14,470	22,415	33,428	8,197	51,915	17
18		83,680	31,290	4,492	47,898	11,011	14,471	22,416	33,427	7,546	59,461	18
19		83,680	31,290	4,492	47,898	11,014	14,470	22,415	33,428	6,947	66,409	19
20		83,680	31,290	4,492	47,898	11,011	14,471	22,416	33,427	6,396	72,805	20
21		83,680	31,290	4,492	47,898	5,507	16,630	25,761	31,268	5,508	78,313	21
22		83,680	31,290	4,492	47,898	0	18,790	29,108	29,108	4,721	83,033	22
23		83,680	31,290	4,492	47,898	0	18,790	29,108	29,108	4,346	87,379	23
24		83,680	31,290	4,492	47,898	0	18,790	29,108	29,108	4,001	91,380	24
25		83,680	31,290	4,492	47,898	0	18,790	29,108	29,108	3,684	95,064	25
26		83,680	31,290	4,492	47,898	0	18,790	29,108	29,108	3,391	98,455	26
27		83,680	31,290	4,492	47,898	0	18,790	29,108	29,108	3,122	101,577	27
28		83,680	31,290	4,492	47,898	0	18,790	29,108	29,108	2,874	104,451	28
29		83,680	31,290	4,492	47,898	0	18,790	29,108	29,108	2,646	107,097	29
30		83,680	31,290	4,492	47,898	0	18,790	29,108	29,108	2,436	109,534	30
31		83,680	31,290	4,492	47,898	0	18,790	29,108	29,108	2,243	111,777	31
32		83,680	31,290	4,492	47,898	0	18,790	29,108	29,108	2,065	113,841	32
33		83,680	31,290	4,492	47,898	0	18,790	29,108	29,108	1,901	115,742	33
34		83,680	31,290	4,492	47,898	0	18,790	29,108	29,108	1,750	117,493	34
35		83,680	31,290	4,492	47,898	0	18,790	29,108	29,108	1,611	119,104	35
36		83,680	31,290	4,492	47,898	0	18,790	29,108	29,108	1,483	120,587	36
37		83,680	31,290	4,492	47,898	0	18,790	29,108	29,108	1,366	121,953	37
38		83,680	31,290	4,492	47,898	0	18,790	29,108	29,108	1,257	123,210	38
39		83,680	31,290	4,492	47,898	0	18,790	29,108	29,108	1,158	124,368	39
40		83,680	31,290	4,492	47,898	0	18,790	29,108	29,108	1,066	125,433	40
41		83,680	31,290	4,492	47,898	0	18,790	29,108	29,108	981	126,414	41
42		83,680	31,290	4,492	47,898	0	18,790	29,108	29,108	903	127,318	42
43		83,680	31,290	4,492	47,898	0	18,790	29,108	29,108	832	128,149	43
44		83,680	31,290	4,492	47,898	0	18,790	29,108	29,108	766	128,915	44
45		83,680	31,290	4,492	47,898	0	18,790	29,108	29,108	705	129,619	45
46		83,680	31,290	4,492	47,898	0	18,790	29,108	29,108	649	130,268	46
47		83,680	31,290	4,492	47,898	0	18,790	29,108	29,108	597	130,866	47
48		83,680	31,290	4,492	47,898	0	18,790	29,108	29,108	550	131,416	48
49		83,680	31,290	4,492	47,898	0	18,790	29,108	29,108	506	131,922	49
50		83,680	31,290	4,492	47,898	0	18,790	29,108	29,108	466	132,388	50
51		83,680	31,290	4,492	47,898	0	18,790	29,108	29,108	429	132,817	51
52		83,680	31,290	4,492	47,898	0	18,790	29,108	29,108	395	133,212	52
53		83,680	31,290	4,492	47,898	0	18,790	29,108	29,108	364	133,576	53
54		83,680	31,290	4,492	47,898	0	18,790	29,108	29,108	335	133,911	54
55		83,680	31,290	4,492	47,898	0	18,790	29,108	29,108	308	134,219	55
56		83,680	31,290	4,492	47,898	0	18,790	29,108	(217,726)	(2,123)	132,096	56
Total	246,834	4,686,080	1,752,240	251,552	2,682,288	246,834	955,429	1,480,025	1,233,191	132,096	3,285,760	

BAY STATE GAS CO. MAIN ORDER

Bay State Gas Company

D.T.E. 05-27

Attachment RR-DTE-136(b)

ROR 13.18% Page 56 of 62

DIVISION BROCKTON

WORK CODE MNRC

DESCRIPTION/COMMENTS NEW MAIN:

This authorization reflects the estimated cost to provide natural gas to 38 new homes.

**PRE-CONSTRUCTION
IRR**

* Stearns Hill Estates - Phase 2

Builder to dig, backfill and sand

DOWNTOWN

SUBURBS X

BUILDER POLICY

X

CUST. CONTR \$0

COST RECORD	SOURCE	BUDGET	ACTUAL	VARIANCE
MATERIAL		15,160.00		
LABOR		7,075.00		
CONTRACTOR		28,305.00		
OVERHEAD				
TOTAL		\$50,540.00		

B9400101

START DATE 8/15/94
 COMP. DATE 10/13/94
 ESTIMATOR RG 7/12/84
 PROJ/NOMAD 4337
 COMPLETE

Y	N
---	---

 SUPPLEMENT

Y	N
---	---

PIPE INSTALLED: FROM: E.O.M. @ Hse #151
 Stearns Ave
 Stearns Ave
 Old Stable Dr

Hse #231
 TO: Lot #185
 Old North Trail
 Carriage House Lane

STREET NAME & TOWN		SIZE	TYPE	ESTIMATE	FOOTAGE ACTUAL	ACCOUNT NUMBER	DIST. %	COST PER FT.
1	Stearns Ave Mansfield	6.0	PP	2152	2534	192159		
2	Carriage House Lane Mansfield	2.0	PP	1400	1500	192162		
3	Old Stable Dr Mansfield	2.0	PP	1320	1275	192163		
4	Old North Trail Mansfield	2.0	PP	800	880	192164		
5								
6								

PIPE RETIRED		SIZE	TYPE	ESTIMATE	FOOTAGE ACTUAL	ACCOUNT NUMBER	INST. YEAR	COST PER FT.
1								
2								
3								
4								
5								
6								

EXTENSION	<u>X</u>	GROWTH	<u>X</u>
REPLACEMENT		BUILDER POLICY	<u>X</u>
MUNICIPAL IMP		CONTRIBUTION	
SYSTEM IMP		CO. LABOR	
NO. OF SERVICES	<u>38</u>	SPECIAL CREWS	
RATE OF RETURN	<u>X</u>	RESIDENTIAL	<u>X</u>
BUDGETED		COMM./INDUST.	
PERMIT RECEIVED		PRESSURE	<u>H</u>

(ACCOUNTING INFO) CLOSE TO PLANT

APPROVAL: UNDER 25K

J. Kelly 7/25/94
 DEPT. MGR. *M. J. 7/11/94*
 DIV. ENG. *R. S. Reppert 7/15/94*
 DIV. MGR. *F. E. Kelly 7/15/94*

APPROVAL: OVER 25K

CORP. MARKET
 SR. VP OPER. *7/29/94*
 CONTROLLER *7/29/94*
A.C. 8/2/94

ATTACHMENT RR-DTE-136 (b)

Revenue Producing Plants Additions
Account 367 (Mains) > \$50K and < \$100K

List No. 17 (on DTE-3-27 Revised)

POST CONSTRUCTION - RATE OF RETURN ESTIMATE

WORKPAPER

POST-CONSTRUCTION

Project: Red Fox Drive
Agawam

Total Capital and O&M Costs

Meter Counts, Mcf Load and Net Revenue

Capital			Meter Counts	35
Mains	\$	104,300		
Services		41,374	Load (Mcf)	4,165
Meters		0		
Marginal Capital		0	Net Revenue	\$ 14,884 annual
Total	\$	145,674		
O & M costs	\$	5,717 annual		
Property Tax Rate	\$	21.22 per thousand		

Results Summary

	55 Yrs.
* IRR	2.84%
* NPV	(\$75,581)
* Customer Contribution	\$124,373

Year	Investment	Revenue	O&M	Property Tax	Profit Before Taxes	Depreciation 20 Year Class	Income Taxes	Total Net Income	Total Net Cash Flow (\$145,674)	P.V. OF Cash Flow (\$145,674)	Payback Calculation (\$145,674)	Payback Period
1	\$145,674	\$14,884	\$5,717	\$3,091	\$6,076	\$5,463	\$241	\$373	\$5,835	5,372	(\$140,302)	1
2		14,884	5,717	3,091	6,076	10,516	(1,742)	(2,698)	7,818	6,626	(133,675)	2
3		14,884	5,717	3,091	6,076	9,727	(1,432)	(2,219)	7,508	5,859	(127,817)	3
4		14,884	5,717	3,091	6,076	8,998	(1,146)	(1,776)	7,222	5,189	(122,628)	4
5		14,884	5,717	3,091	6,076	8,322	(881)	(1,365)	6,957	4,601	(118,027)	5
6		14,884	5,717	3,091	6,076	7,699	(637)	(986)	6,713	4,087	(113,939)	6
7		14,884	5,717	3,091	6,076	7,121	(410)	(635)	6,486	3,636	(110,304)	7
8		14,884	5,717	3,091	6,076	6,587	(201)	(311)	6,277	3,239	(107,064)	8
9		14,884	5,717	3,091	6,076	6,500	(166)	(258)	6,242	2,966	(104,099)	9
10		14,884	5,717	3,091	6,076	6,499	(166)	(257)	6,242	2,730	(101,368)	10
11		14,884	5,717	3,091	6,076	6,500	(166)	(258)	6,242	2,514	(98,854)	11
12		14,884	5,717	3,091	6,076	6,499	(166)	(257)	6,242	2,314	(96,540)	12
13		14,884	5,717	3,091	6,076	6,500	(166)	(258)	6,242	2,131	(94,410)	13
14		14,884	5,717	3,091	6,076	6,499	(166)	(257)	6,242	1,961	(92,448)	14
15		14,884	5,717	3,091	6,076	6,500	(166)	(258)	6,242	1,806	(90,642)	15
16		14,884	5,717	3,091	6,076	6,499	(166)	(257)	6,242	1,662	(88,980)	16
17		14,884	5,717	3,091	6,076	6,500	(166)	(258)	6,242	1,531	(87,449)	17
18		14,884	5,717	3,091	6,076	6,499	(166)	(257)	6,242	1,409	(86,040)	18
19		14,884	5,717	3,091	6,076	6,500	(166)	(258)	6,242	1,297	(84,743)	19
20		14,884	5,717	3,091	6,076	6,499	(166)	(257)	6,242	1,194	(83,548)	20
21		14,884	5,717	3,091	6,076	3,250	1,109	1,717	4,967	875	(82,673)	21
22		14,884	5,717	3,091	6,076	0	2,384	3,692	3,692	599	(82,075)	22
23		14,884	5,717	3,091	6,076	0	2,384	3,692	3,692	551	(81,523)	23
24		14,884	5,717	3,091	6,076	0	2,384	3,692	3,692	508	(81,016)	24
25		14,884	5,717	3,091	6,076	0	2,384	3,692	3,692	467	(80,548)	25
26		14,884	5,717	3,091	6,076	0	2,384	3,692	3,692	430	(80,118)	26
27		14,884	5,717	3,091	6,076	0	2,384	3,692	3,692	396	(79,722)	27
28		14,884	5,717	3,091	6,076	0	2,384	3,692	3,692	365	(79,358)	28
29		14,884	5,717	3,091	6,076	0	2,384	3,692	3,692	336	(79,022)	29
30		14,884	5,717	3,091	6,076	0	2,384	3,692	3,692	309	(78,713)	30
31		14,884	5,717	3,091	6,076	0	2,384	3,692	3,692	285	(78,428)	31
32		14,884	5,717	3,091	6,076	0	2,384	3,692	3,692	262	(78,166)	32
33		14,884	5,717	3,091	6,076	0	2,384	3,692	3,692	241	(77,925)	33
34		14,884	5,717	3,091	6,076	0	2,384	3,692	3,692	222	(77,703)	34
35		14,884	5,717	3,091	6,076	0	2,384	3,692	3,692	204	(77,499)	35
36		14,884	5,717	3,091	6,076	0	2,384	3,692	3,692	188	(77,311)	36
37		14,884	5,717	3,091	6,076	0	2,384	3,692	3,692	173	(77,138)	37
38		14,884	5,717	3,091	6,076	0	2,384	3,692	3,692	159	(76,978)	38
39		14,884	5,717	3,091	6,076	0	2,384	3,692	3,692	147	(76,831)	39
40		14,884	5,717	3,091	6,076	0	2,384	3,692	3,692	135	(76,696)	40
41		14,884	5,717	3,091	6,076	0	2,384	3,692	3,692	124	(76,572)	41
42		14,884	5,717	3,091	6,076	0	2,384	3,692	3,692	115	(76,457)	42
43		14,884	5,717	3,091	6,076	0	2,384	3,692	3,692	105	(76,351)	43
44		14,884	5,717	3,091	6,076	0	2,384	3,692	3,692	97	(76,254)	44
45		14,884	5,717	3,091	6,076	0	2,384	3,692	3,692	89	(76,165)	45
46		14,884	5,717	3,091	6,076	0	2,384	3,692	3,692	82	(76,083)	46
47		14,884	5,717	3,091	6,076	0	2,384	3,692	3,692	76	(76,007)	47
48		14,884	5,717	3,091	6,076	0	2,384	3,692	3,692	70	(75,937)	48
49		14,884	5,717	3,091	6,076	0	2,384	3,692	3,692	64	(75,873)	49
50		14,884	5,717	3,091	6,076	0	2,384	3,692	3,692	59	(75,814)	50
51		14,884	5,717	3,091	6,076	0	2,384	3,692	3,692	54	(75,759)	51
52		14,884	5,717	3,091	6,076	0	2,384	3,692	3,692	50	(75,709)	52
53		14,884	5,717	3,091	6,076	0	2,384	3,692	3,692	46	(75,663)	53
54		14,884	5,717	3,091	6,076	0	2,384	3,692	3,692	42	(75,621)	54
55		14,884	5,717	3,091	6,076	0	2,384	3,692	3,692	39	(75,581)	55
56		14,884	5,717	3,091	6,076	0	2,384	3,692	(141,982)	(1,384)	(76,966)	56
Total	145,674	833,504	320,152	173,096	340,256	145,674	76,335	118,247	(27,427)	(76,966)	(5,024,808)	

Rec 7/9/92

7/8/92

BAY STATE GAS CO. MAIN ORDER

Bay State Gas Company

DIVISION SPFLD AUTH. NO:2- MNERB RATE OF RETURN 9.98% Attachment RR-DPE-136(b) D.T.E. 05-27 Page 59 of 62

DESCRIPTION / COMMENTS: Red Fox Drive - Agawam
Install 7085 ft. of 2" IP main to provide gas service to an existing
subdivision consisting of 80 houses. This subdivision has been evaluated
by sales and marketing on a five year basis. There are currently 18
signed contracts. PRE-CONSTRUCTION
IRR

DOWNTOWN _____ SUBURBS X BUILDER POLICY _____ CUST. CONTR. \$ _____

COST RECORD	SOURCE	BUDGET	ACTUAL	VARIANCE	START DATE	/	/1992
MATERIAL		9310			COMP. DATE	/	/
LABOR		82165			ESTIMATOR	MPK	
CONTRACTOR					PROG NO./	NOMAD	
OVERHEAD					COMPLETE	Y	N
TOTAL		\$91,475			SUPPLEMENT	Y	N

PIPE INSTALLED: FROM: Intersec. of ~~North~~ South West St to:

	STREET NAME & TOWN	SIZE	TYPE	FOOTAGE EST. FINAL	ACCOUNT NUMBER	DIST %	COST PER FT
1	Red Fox Dr. - Agawam	2"	PP	1975 - 100 * 116287			
2	White Fox Dr. - Agawam	2"	PP	2230 - 100 * 116288			
3	Pheasant Run Cir. - Agawam	2"	PP	1200 - 100 * 116290			
4	Woodcock Ct. - Agawam	2"	PP	655 - 100 * 116292			
5	Partridge La. - Agawam	2"	PP	1025 - 100 * 116291			
6	Pheasant Run Ct	2	PP	400 - 100 * 116289			

	PIPE RETIRED	SIZE	TYPE	FOOTAGE EST. FINAL	ACCOUNT NUMBER	INST. YR.	COST PER FT
1							
2							
3							
4							
5							

TYPE: 'X' OFF ALL WHICH APPLY

<input checked="" type="checkbox"/> EXTENSION	<input checked="" type="checkbox"/>	GROWTH	<input checked="" type="checkbox"/>
REPLACEMENT		BUILDER POLICY	
MUNICIPAL IMP.		CONTRIBUTION	
SYSTEM IMP.		CO. LABOR	<input checked="" type="checkbox"/>
NO. OF SERVICES	48	SPECIAL CREWS	
RATE OF RETURN	<input checked="" type="checkbox"/>	RESIDENTIAL	<input checked="" type="checkbox"/>
BUDGETED		COMM. INDUST.	
PERMIT RECEIVED	<input checked="" type="checkbox"/>	PRESSURE	<input checked="" type="checkbox"/>

ACCOUNTING INFO CLOSE TO PLANT

Mylar 19 / (2)

APPROVAL: UNDER \$25K

DEPT. MGR. SPK

DIV. ENG. JD

DIV. MGR.

APPROVAL: OVER \$25K

CORP. MARKET

SR. V.P. OPER.

CORP. C.F.O.

92-17

Town

5247 7/...

ATTACHMENT RR-DTE-136 (b)

Revenue Producing Plants Additions
Account 367 (Mains) > \$50K and < \$100K

List No. 18 (on DTE-3-27 Revised)

POST CONSTRUCTION - RATE OF RETURN ESTIMATE

WORKPAPER

POST-CONSTRUCTION

Project: College Highway
Southwick

Total Capital and O&M Costs

Meter Counts, Mef Load and Net Revenue

Capital			Meter Counts	80
Mains	\$	104,337	Load (Mef)	4,320
Services		77,669		
Meters		0	Net Revenue	\$ 22,344 annual
Marginal Capital		0		
Total	\$	182,006		
O & M costs	\$	12,702 annual		
Property Tax Rate	\$	14.88 per thousand		

Results Summary

	55 Yrs.
* IRR	2.48%
* NPV	(\$99,017)
* Customer Contribution	\$162,938

Year	Investment	Revenue	O&M	Property Tax	Profit Before Taxes	Depreciation 20 Year Class	Income Taxes	Total Net Income	Total Net Cash Flow (\$182,006)	P.V. OF Cash Flow (\$182,006)	Payback Calculation (\$182,006)	Payback Period
1	\$182,006	\$22,344	\$12,702	\$2,708	\$6,934	\$6,825	543	\$66	\$6,891	6,344	(\$175,662)	1
2		22,344	12,702	2,708	6,934	13,139	(2,434)	(3,771)	9,368	7,940	(167,721)	2
3		22,344	12,702	2,708	6,934	12,153	(2,047)	(3,171)	8,981	7,008	(160,713)	3
4		22,344	12,702	2,708	6,934	11,243	(1,690)	(2,618)	8,624	6,196	(154,517)	4
5		22,344	12,702	2,708	6,934	10,398	(1,359)	(2,105)	8,293	5,485	(149,033)	5
6		22,344	12,702	2,708	6,934	9,619	(1,053)	(1,632)	7,987	4,863	(144,169)	6
7		22,344	12,702	2,708	6,934	8,896	(770)	(1,193)	7,704	4,319	(139,851)	7
8		22,344	12,702	2,708	6,934	8,230	(509)	(788)	7,443	3,841	(136,010)	8
9		22,344	12,702	2,708	6,934	8,121	(466)	(721)	7,400	3,516	(132,494)	9
10		22,344	12,702	2,708	6,934	8,119	(465)	(720)	7,399	3,236	(129,257)	10
11		22,344	12,702	2,708	6,934	8,121	(466)	(721)	7,400	2,980	(126,277)	11
12		22,344	12,702	2,708	6,934	8,119	(465)	(720)	7,399	2,743	(123,534)	12
13		22,344	12,702	2,708	6,934	8,121	(466)	(721)	7,400	2,526	(121,009)	13
14		22,344	12,702	2,708	6,934	8,119	(465)	(720)	7,399	2,325	(118,683)	14
15		22,344	12,702	2,708	6,934	8,121	(466)	(721)	7,400	2,141	(116,543)	15
16		22,344	12,702	2,708	6,934	8,119	(465)	(720)	7,399	1,971	(114,572)	16
17		22,344	12,702	2,708	6,934	8,121	(466)	(721)	7,400	1,814	(112,758)	17
18		22,344	12,702	2,708	6,934	8,119	(465)	(720)	7,399	1,670	(111,087)	18
19		22,344	12,702	2,708	6,934	8,121	(466)	(721)	7,400	1,538	(109,549)	19
20		22,344	12,702	2,708	6,934	8,119	(465)	(720)	7,399	1,416	(108,134)	20
21		22,344	12,702	2,708	6,934	4,061	1,127	1,746	5,807	1,023	(107,111)	21
22		22,344	12,702	2,708	6,934	0	2,720	4,214	4,214	683	(106,427)	22
23		22,344	12,702	2,708	6,934	0	2,720	4,214	4,214	629	(105,798)	23
24		22,344	12,702	2,708	6,934	0	2,720	4,214	4,214	579	(105,219)	24
25		22,344	12,702	2,708	6,934	0	2,720	4,214	4,214	533	(104,686)	25
26		22,344	12,702	2,708	6,934	0	2,720	4,214	4,214	491	(104,195)	26
27		22,344	12,702	2,708	6,934	0	2,720	4,214	4,214	452	(103,743)	27
28		22,344	12,702	2,708	6,934	0	2,720	4,214	4,214	416	(103,327)	28
29		22,344	12,702	2,708	6,934	0	2,720	4,214	4,214	383	(102,944)	29
30		22,344	12,702	2,708	6,934	0	2,720	4,214	4,214	353	(102,591)	30
31		22,344	12,702	2,708	6,934	0	2,720	4,214	4,214	325	(102,266)	31
32		22,344	12,702	2,708	6,934	0	2,720	4,214	4,214	299	(101,967)	32
33		22,344	12,702	2,708	6,934	0	2,720	4,214	4,214	275	(101,692)	33
34		22,344	12,702	2,708	6,934	0	2,720	4,214	4,214	253	(101,439)	34
35		22,344	12,702	2,708	6,934	0	2,720	4,214	4,214	233	(101,206)	35
36		22,344	12,702	2,708	6,934	0	2,720	4,214	4,214	215	(100,991)	36
37		22,344	12,702	2,708	6,934	0	2,720	4,214	4,214	198	(100,793)	37
38		22,344	12,702	2,708	6,934	0	2,720	4,214	4,214	182	(100,611)	38
39		22,344	12,702	2,708	6,934	0	2,720	4,214	4,214	168	(100,444)	39
40		22,344	12,702	2,708	6,934	0	2,720	4,214	4,214	154	(100,289)	40
41		22,344	12,702	2,708	6,934	0	2,720	4,214	4,214	142	(100,147)	41
42		22,344	12,702	2,708	6,934	0	2,720	4,214	4,214	131	(100,017)	42
43		22,344	12,702	2,708	6,934	0	2,720	4,214	4,214	120	(99,896)	43
44		22,344	12,702	2,708	6,934	0	2,720	4,214	4,214	111	(99,785)	44
45		22,344	12,702	2,708	6,934	0	2,720	4,214	4,214	102	(99,683)	45
46		22,344	12,702	2,708	6,934	0	2,720	4,214	4,214	94	(99,589)	46
47		22,344	12,702	2,708	6,934	0	2,720	4,214	4,214	86	(99,503)	47
48		22,344	12,702	2,708	6,934	0	2,720	4,214	4,214	80	(99,423)	48
49		22,344	12,702	2,708	6,934	0	2,720	4,214	4,214	73	(99,350)	49
50		22,344	12,702	2,708	6,934	0	2,720	4,214	4,214	67	(99,283)	50
51		22,344	12,702	2,708	6,934	0	2,720	4,214	4,214	62	(99,220)	51
52		22,344	12,702	2,708	6,934	0	2,720	4,214	4,214	57	(99,163)	52
53		22,344	12,702	2,708	6,934	0	2,720	4,214	4,214	53	(99,111)	53
54		22,344	12,702	2,708	6,934	0	2,720	4,214	4,214	48	(99,062)	54
55		22,344	12,702	2,708	6,934	0	2,720	4,214	4,214	45	(99,017)	55
56		22,344	12,702	2,708	6,934	0	2,720	4,214	(177,792)	(1,734)	(100,751)	56
Total	182,006	1,251,264	711,312	151,648	388,304	182,006	80,931	125,367	(56,639)	(100,751)	(6,484,320)	

DATE: 6/12/91
Bay State Gas Company
D.T.E 90527
Attachment RR-DTE-136(b)
Page 62 of 62

BAY STATE GAS CO. MAIN ORDER AUTH. NO: 2-10106-0006 RATE OF RETURN 10.1%

DIVISION SPRINGFIELD COLLEGE HIGHWAY - SOUTHWICK

DESCRIPTION / COMMENTS: COLLEGE HIGHWAY - SOUTHWICK

- INSTALL 6600 FEET OF 6" IP MAIN ON COLLEGE HIGHWAY IN SOUTHWICK IN ORDER TO PROVIDE GAS SERVICE TO 88 NEW CONDOMINIUMS.

PRE-CONSTRUCTION IRR

DOWNTOWN SUBURBS X BUILDER POLICY CUST. CONTR. \$

COST RECORD	SOURCE	BUDGET	ACTUAL	VARIANCE	START DATE	/	/	1991
MATERIAL		15,715			COMP. DATE	12	1	1992
LABOR		44,000			ESTIMATOR	MPK		
CONTRACTOR					PROG NO. /	NOMAD		
OVERHEAD					COMPLETE	Y	N	
TOTAL		59,715			SUPPLEMENT	Y	N	

PIPE INSTALLED: FROM: TO: SOUTHWICK/WESTFIELD TOWN LINE

	STREET NAME & TOWN	SIZE	TYPE	FOOTAGE EST.	FINAL	ACCOUNT NUMBER	DIST #	COST PER FT
1	COLLEGE HIGHWAY - SOUTHWICK	6	PP	6600	2585	T 12/92		
2	JARRY	2	"		1569	T 3/93		
3								
4								
5								
6								

	PIPE RETIRED	SIZE	TYPE	FOOTAGE EST.	FINAL	ACCOUNT NUMBER	INST. YR.	COST PER FT
1								
2								
3								
4								
5								

TYPE: 'X' OFF ALL WHICH APPLY

EXTENSION	X	GROWTH	X
REPLACEMENT		BUILDER POLICY	
MUNICIPAL IMP.		CONTRIBUTION	
SYSTEM IMP.		CO. LABOR	
NO. OF SERVICES	14	SPECIAL CREWS	
RATE OF RETURN	X	RESIDENTIAL	X
BUDGETED		COMM. INDUST.	
PERMIT RECEIVED		PRESSURE	IP

ACCOUNTING INFO CLOSE TO PLANT

APPROVAL: UNDER \$25K
DEPT. MGR. *[Signature]*
DIV. ENG. *[Signature]*
DIV. MGR. *[Signature]*
APPROVAL: OVER \$25K
CORP. MARKET
SR. V.P. OPER. *[Signature]*
CORP. C.F.O. *[Signature]* 6/24/91

COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF TELECOMMUNICATIONS AND ENERGY

RESPONSE OF BAY STATE GAS COMPANY TO
RECORD REQUESTS FROM THE D.T.E.
D.T.E. 05-27

Date: August 11, 2005

Responsible: John E. Skirtich, Consultant (Revenue Requirements)

RR-DTE-144: Determine if Northern contributed to its portion of the invoice from Coler & Colantonio.

Response: There were no dollars allocated to Northern for the expenses associated with the building blue prints provided by Coler & Colantonio. Bay State will correct this matter in August and book a portion of the expenses (see Attachment RR-DTE-144) to Northern. Further, the Company will reflect this credit to its next rate case expense update filed every two weeks as part of DTE-15-58 (i.e., the charges associated with Coler & Colantonio will be reduced by the amount allocated to Northern).

Bay State Gas Company
Rate Case Expense
Coler & Colantonio, Inc.
Project Number 65-20.00

<u>Billing Period</u>	<u>Amount</u>
	\$
06/27/04 - 07/31/04	3,594
08/01/04 - 08/28/04	13,163
08/29/04 - 10/02/04	1,208
10/03/04 - 10/30/04	385
10/31/04 - 11/27/04	414
Total Coler & Colantonio Expenses	<u>18,764</u>
Percent Allocated to Northern	<u>16.40%</u>
Total Amount Allocated to Northern	<u><u>\$3,077.00</u></u>

COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF TELECOMMUNICATIONS AND ENERGY

RESPONSE OF BAY STATE GAS COMPANY TO
RECORD REQUESTS FROM THE D.T.E.
D.T.E. 05-27

Date: August 11, 2005

Responsible: Danny G. Cote, General Manager

RR-DTE-149: Similar to RR-DTE-105 (Cote), perform an incremental analysis for project list # 7 to establish the cost associated with installing a bigger pipe (the addition plus the added cost of 6-inch to 8).

Response: The project identified in list 7 (The West Side Uprate) described the replacement of 1,941 feet of 6" bare steel main with 8" coated steel main. In addition, 1,394 feet of 8" coated cathodically protected steel main was installed to provide for increased system pressure and capacity.

The incremental portion of the cost per foot to replace the 6" bare steel with 8" coated cathodically protected steel (as apposed to replacing the 6" bare steel with 6" coated cathodically protected steel) is \$7.23 per foot based on 2005 construction and material costs as shown in RR-DTE-105 (Cote). Thus, the total cost of increasing the diameter from 6" to 8" over the 1,941 feet replaced is \$14,033.

Further, the additional 1,394 feet of 8" coated steel was installed at the average cost per foot of this project, which was \$142.45. Thus the 1,394 feet that was not direct replacement (as show above) represented a portion of the project amounting to \$198,595.

Therefore, the combination of increased pipe diameter and pipe length needed in this project to meet our system design needs was done at an incremental cost of \$212,628 as compared to a direct replacement of the existing 6" steel main.

COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF TELECOMMUNICATIONS AND ENERGY

RESPONSE OF BAY STATE GAS COMPANY TO
RECORD REQUESTS FROM THE D.T.E.
D.T.E. 05-27

Date: August 11, 2005

Responsible: Danny G. Cote, General Manager

RR-DTE-157: Provide a portion of any technical manual that describes, in detail, the various types of corrosion.

Response: Attachment RR-DTE-157 contains an excerpt from a NACE Handbook entitled Forms of Corrosion Recognition and Prevention. The excerpt describes, in detail, the eight forms of corrosion.

**Forms of
Corrosion** C. P. Dillon-Editor
**RECOGNITION
AND
PREVENTION**

AN OFFICIAL
NACE
PUBLICATION

NACE HANDBOOK 1

THE PURPOSE of this manual is to introduce the reader to the eight forms of corrosion and to illustrate their macro- and micro-appearance as they occur in conventional engineering metals and alloys. Diagrams are occasionally employed to illustrate mechanisms, but photographs and photomicrographs are employed wherever possible, together with Case Histories in sufficient detail to enable understanding of the particular problems and the means taken to ameliorate the situations.

The editor and authors have elected to follow the classifications of corrosion popularized by Dr. Mars G. Fontana,¹ except that crevice corrosion and pitting are considered in one category (i.e., Localized Corrosion), permitting the use of the eighth grouping to embrace certain high temperature phenomena.

The eight forms of corrosion overlap to some extent. For example, De-Alloying (sometimes called Parting Corrosion in older texts) may follow a uniform mode (e.g., "layer-type dezincification") or may be highly localized (e.g., "plug-type dezincification"). Galvanic or "Two-Metal" corrosion may manifest itself either as general or uniform corrosion or as localized attack, depending upon geometry and conductivity in a specific situation. One type of corrosion may mitigate another, as when erosion-corrosion of heat exchanger tubes at the inlet end is diminished by the galvanic influence of the water-box.

In the following chapters, phenomena which are not clearly identified as belonging to one of the eight categories have been assigned to a particular chapter by mutual agreement between the editor and authors.

Forms of Corrosion

The eight forms of corrosion (Figure 0.1) may be divided into three categories:

- Group I — Those readily identifiable by visual examination.
- Group II — Those which may require supplementary means of examination.
- Group III — Those which usually should be verified by microscopy of one kind or another (optical, scanning electron, etc.). These are sometimes apparent to the naked eye.

Group I

1. Uniform Corrosion. This type of general corrosion is characterized by an even, regular loss of metal from the cor-

roding surface. All metals are subject to this type of attack under some conditions. It is the most desirable form of corrosion insofar as it lends itself most easily to predicting the life of equipment.

2. Localized Corrosion. In localized attack, all or most of the metal loss occurs at discrete areas. Pitting may occur on a freely exposed surface of a metal or alloy where the surface is non-homogeneous [has local cells set up by metallurgical differences (composition and structure of the metal)] under deposits of foreign matter or at imperfections in a film or coating.

Crevice corrosion is a particular form of pitting, usually induced between faying surfaces (e.g., nuts and bolts, riveted joints, threaded connections, flange surfaces, etc.), usually due to localized differences in the environment, for example, oxygen concentration cells or metal ion cells.

3. Galvanic Corrosion. This type of attack is occasioned by electrical contact between dissimilar conductors in an electrolyte (e.g., copper and steel in water). The intensity of corrosion depends primarily on the difference in solution potential between the materials — the further apart in the Galvanic Series, the greater the possible corrosion of the anodic member of the galvanic couple — and secondarily on the effects of relative area and geometry. Conductive films may also cause a galvanic effect on metals (e.g., Fe_3O_4 , "magnetite" or "mill-scale" on steel; lead sulfate films on lead in sulfuric acid), and conductive nonmetals like carbon can function as cathodes to metallic anodes.

Group II

1. Velocity Effects. Erosion-corrosion is attack accelerated by high velocity flow, either washing away otherwise protective films or mechanically disturbing the metal itself. The true nature of the attack, especially the differentiation of the effects of particulate matter in the stream, may require supplementary microscopy, despite the characteristic flow patterns visible to the naked eye.

Cavitation is a special form of attack, damage caused by the collapse of bubbles formed at areas of low pressure in a flowing stream.

Fretting is caused by vibratory relative motion of two surfaces in close contact under load. The nature of the wear and determination of the presence of minute oxidation products may require microscopic examination.

2. Intergranular Corrosion. Preferential attack of small areas at the grain boundaries in the metal structure may

permit physical removal of whole grains ("sugaring"), although only a small amount of metal is actually dissolved. This may be apparent to the naked eye, but more often optical microscopy at least is required to confirm the mode of attack.

3. De-Alloying Corrosion. This type of corrosion is the selective dissolution of one component of an alloy, for example, zinc from yellow brass, leaving a pseudomorph of the original artifact. Because the dimensions are substantially unchanged, mechanical probing or microscopy is usually required as a supplement to the visual inspection.

Group III

1. Cracking Phenomena. These include both corrosion fatigue, a mechanical phenomenon enhanced by non-specific corrosive environments, and environmental cracking, in which a brittle failure is induced in an otherwise ductile material under tensile stress in an environment specific for the alloy system. Environmental cracking is a broad category, which the editor and authors have decided should embrace true stress corrosion cracking, hydrogen induced cracking of various kinds, and liquid metal cracking.⁽¹⁾ Any cracking type failure should be diagnosed using at least optical microscopy. A scanning electron microscope is a valuable tool for differentiating the more obscure forms of attack, such as intergranular stress corrosion cracking from hot-short cracking, and transgranular SCC from corrosion fatigue.

2. High Temperature Corrosion. Although this can sometimes be identified by simple visual observation, more often a microscopic examination is required. This is due to subsurface phenomena within the matrix of the alloy, as well as obscured relations at the interface of the alloy with the surface films formed in many high temperature exposures.

3. Microbial Effects. Certain types of bacteria or microbes can influence corrosion when their metabolism produces corrosive species in an otherwise innocuous environment, or when they produce deposits which can lead to electrochemical attack. Most often, the ultimate effect is some form of localized corrosion, but a biochemical analysis is required (rather than simple microscopy) to identify the offending organism.